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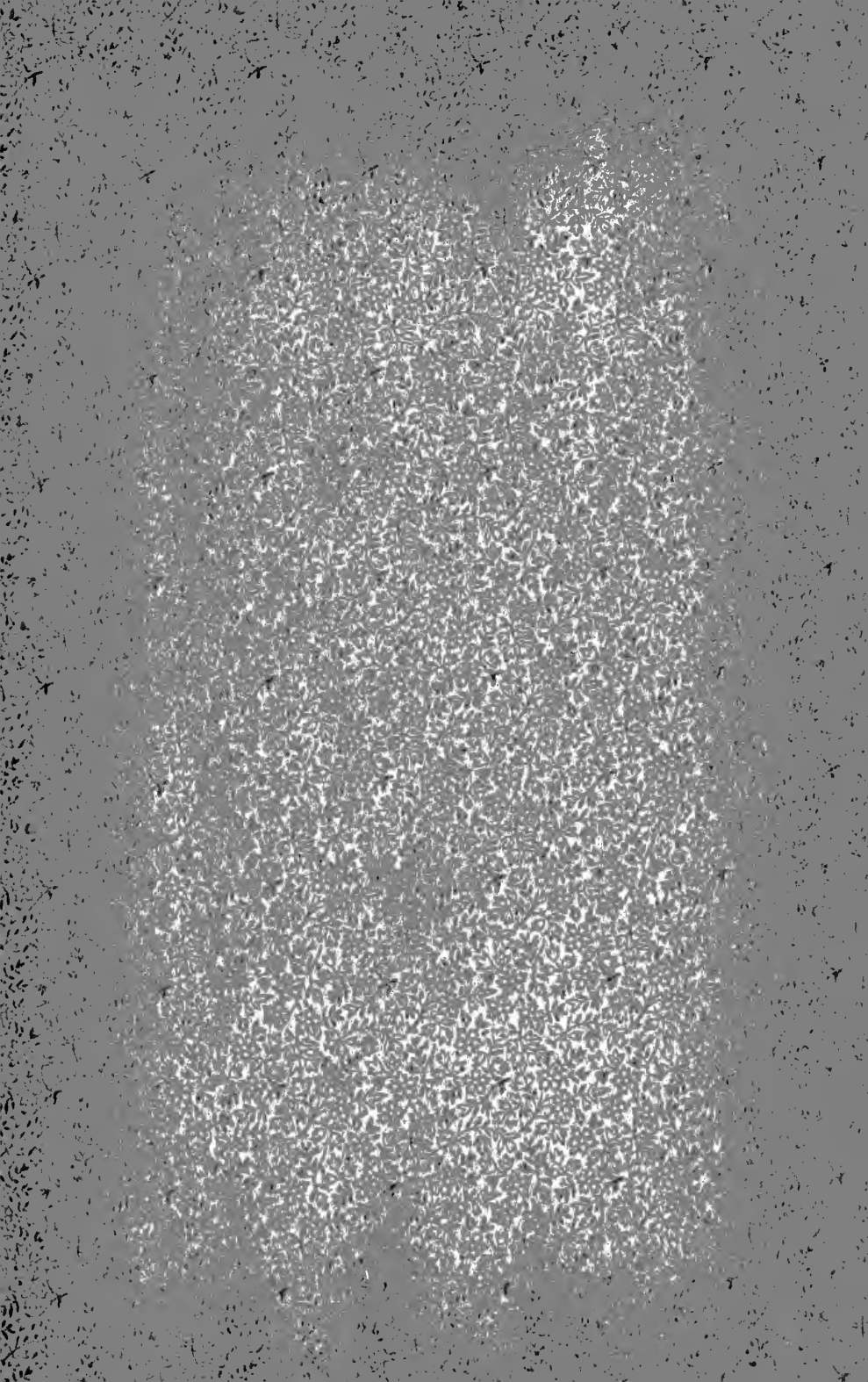
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SEVENTEENTH ANNUAL REPORT
OF THE
PROVINCIAL BOARD OF HEALTH
OF ONTARIO

BEING FOR THE YEAR

1898.

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY.



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SEVENTEENTH ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH.

INTRODUCTION.

To His Honour the Honourable SIR OLIVER MOWAT, K. G. M. G., Lieutenant-Governor of Ontario.

MAY IT PLEASE YOUR HONOUR :

The Provincial Board of Health, in presenting this its seventeenth annual report, has pleasure in again adverting to the conditions of the public health throughout the past year, as having been favorable, no epidemic has to any extent prevailed, so as to cause general suffering, although complaints have reached the Board that certain lighter infectious troubles were found to exist among the children on the assembling of the schools after the autumn vacations. The Board took steps to inquire into these. The duties of the Board have through the year consisted very much in seeing to the water supply of various localities, and investigating complaints regarding the pollution of streams. The complainants were on one occasion the farmers living on the banks of a small river which before reaching their farms received the sewage of a town of some consideration. It was found difficult to effect a *modus vivendi* between the disputants, and the dairy interests of the neighbourhood possibly still suffer, more than need be, from the mingling in their streams of the impurities of the town. The Board has to regret that in this as in other instances it has found interests which were only seemingly conflicting very difficult to reconcile. Although no epidemic has prevailed, yet one disease of that nature, "smallpox," has appeared in several quarters, introduced first from without the Province, showing its usual disposition to spread in whatever quarter it appeared. The active interference of the Secretary of the Board, who visited many of the localities where the disease was reported to be, causing due measures to be taken for the isolation of infected persons, prevented the prevalence of the disease from including much territory. In connection with smallpox, it seems right to report there is at present a greater risk of its attaining prevalence wherever it gets introduced by reason of an increasing neglect of, and on the part of not a few, even a strong objection to, vaccination. It is to be hoped that public opinion will not permit itself to be further led astray by the fanciful views of certain theorists on this subject, who hold that it is wrong "to provide against the breaking out of one disease by the

infliction of another." There are not wanting, among those who have not attained an old age among us, some who in their European homes have seen the great numbers of scarred and disfigured faces, and the many blind, who have lived and suffered from smallpox before Jenner's great discovery of the results of vaccination became known.

The Board in carrying out its work has still to note as prevailing a comparative indifference with regard to sanitation. That is to say there is not the same appreciation of the value of health laws that is everywhere displayed towards those which care for wealth, and it may be some time before as perfect an organization shall exist because of the one, as exists for the other; but the "Board" looks forward with hope to the time when the value of life and health shall be as highly appreciated as is that of property, and when as competent and as well remunerated officials shall superintend the conditions which appertain to them.

In this introduction to Your Honour of the Report of the Board for the past year, it is not out of place to make especial reference to consumption. More is known of this disease than in former times, but its prevalence continues. It cuts off a greater number of lives than all other infectious diseases combined. The Board has been doing what lies in its power to lessen the incidence of its infection by placing it in the list of notifiable diseases; but if there be any course with regard to it which may in some instances be a practicable preventive, it would seem to be the establishment in fitting localities of hospitals or "homes" whither such as give indications of being affected may betake themselves at a period of the disease early enough for themselves to benefit, as well as for their friends and neighbours to be safe from infection by them.

Respectfully submitted,

J. D. MACDONALD,
Chairman.

ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH

OF ONTARIO.

PART I.

CHAPTER I.

REPORT OF THE SECRETARY.

With December of 1898 there ended the first complete year in which, under the Consolidated Act relating to Births, Marriages and Deaths, passed in 1896, monthly reports of all deaths from contagious diseases are returned to the Registrar-General by the 777 Division Registrars of Ontario, and through which returns the Provincial Board of Health is enabled to accurately and promptly estimate the prevalence throughout the Province of those contagious diseases notifiable under the Public Health Act, since the Secretary of the Board is likewise Deputy Registrar-General.

The monthly reports published during the year 1898 represented returns from an average population of 1,840,000 and of 626 registration divisions; or 80 per cent. of the population was reported upon, and 84 per cent. of the municipal registration divisions.

The following table shows the total deaths from the several diseases reported upon in 1898, as compared with those for the whole Province for the year 1897, taken from the Registrar-General's report of that year:

Table showing the Deaths in Ontario in 1897 and for the Population reported upon by Monthly Returns in 1898.

Year.	Disease.							Totals.
	Smallpox.	Scarlatina.	Diphtheria.	Measles.	Whooping-cough.	Typhoid.	Tuberculosis.	
1897....	169	976	80	163	355	3,154	4,897
1898....	174	387	84	102	579	1,791	2,835

* The monthly returns for 1898 include only deaths from pulmonary tuberculosis or consumption and not other tubercular diseases as of infants and children.

The returns must be looked upon, so far as the more acute contagious diseases are concerned, as representing a high standard of health, both relatively and absolutely, and the Provincial Board of Health as well as the Province has just cause for pleasure that these results are closely associated with its efforts for the improvement of the public health.

Smallpox. The year has been marked, like the two preceding it, by an absence of deaths from this cause; which absence is all the more remarkable in view of the widespread existence of outbreaks of the disease in various states of the American continent. The later months of the year have, however, seen the introduction of the disease into several municipalities which have been succeeded by outbreaks in others in the opening months of 1899. The following table gives the several outbreaks to the end of February, 1899:

Table showing Smallpox Cases in Ontario in 1898 and 1899 to end of February.

County.	Municipality.	Date of outbreak.	Source.	Cases.				Remarks.			
				Total.	Still sick.	Died.	Recovered.	Houses infected.	Houses at present infected.	Isolated in hospital.	Isolated in private houses.
Kent	Camden Tp	Oct. 15	Detroit	4			4	1			4
"	Chatham City	Sept. 30	"	1			1	1			1
North- umberland	Cobourg	Oct. 25	Rochester	1			1			1	
York	Toronto	Dec. 3	"	1			1	1		1	
"	"	Dec. 4	"	1			1	1		1	
"	"	Dec. 28	"	1			1	1		1	
Grenville	Wolford	Jan. 22	Unknown	5	3	2		1	1		3
Prescott	E. Hawkesbury	Jan. 27	Soulanges, Q.	10	8	2		6	6		8
"	W. Hawkesbury	Feb. 3	"	5	3	2		1	1		4
Stormont	Osnabruck	Feb. 3	"	10	7	3		1	1		7
"	Cornwall Tn	Feb. 4	"	1	1			1		1	
Dundas	Williamsburg Tp	Feb. 11	"	4	4			1	1		1
Essex	N. Colchester Tp	Jan. 1	Detroit	1			1	1			1
"	Windsor City	Mar. 1	"	1	1			1		1	

These repeated appearances of this disease in the Province, it being present in four counties at the time of writing this report, would seem to call for some remarks regarding a disease which in recent years has been the cause of so slight anxiety to the people of Ontario. That it has proved during the past few weeks to still possess all those fatal qualities which have marked its course during the thousands of years since Hindoo Brahmins practised inoculation against its ravages, is seen in the mortality caused by it in three of the outbreaks referred to; and that its contagiousness continues to be of the same intense character has been fully illustrated in the history of the Prescott and Stormont cases.]

Comparative prevalence of smallpox in Ontario. Such being the case, it will be of interest to illustrate, by comparative tables showing the notable decrease in deaths from the disease during the past twenty years, the influence of those methods which have been adopted for suppressing outbreaks of contagious disease. The following table shows the deaths from it in Ontario since the first annual report of the Registrar-General was published in 1869. Remembering that the early reports were defective, and that since the organization of the Provincial Board of Health in 1882, accurate information of every outbreak of smallpox has existed, it may be presumed that a notably larger number of deaths actually occurred prior to that period than is represented by the figures.

Table showing deaths from smallpox, 1869-1898, in ten year periods.

Year.	Deaths.	Year.	Deaths.	Year.	Deaths.
1869	4	1879	195	1889	13
1870	2	1880	143	1890	none
1871	38	1881	5	1891	none
1872	187	1882	15	1892	none
1873	72	1883	4	1893	none
1874	112	1884	63	1894	5
1875	not reported	1885	30	1895	none
1876	31	1886	19	1896	none
1877	45	1887	none	1897	none
1878	36	1888	3	1898	none
Total	527	Total	477	Total	18

The above figures and those in the diagram on a succeeding page illustrate graphically the percentage prevalence of this disease, from which may be gained some idea both of the lives saved to the state and the saving to municipalities in combatting the spread of the disease.

Table showing deaths from smallpox in the different counties of Ontario, 1869-1898.

	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	Total.
Algoma													3															7
Brant	3	2				3		8																				16
Bruce	10																											12
Carleton	33	3	13				1	127	97	2			1	11	12													300
Dufferin																												
Elgin						1													12					1	2			16
Essex	23	1			1	14	1	2		1	9							1					2					55
Frontenac	5				4																							9
Grey	2		1		1								1															5
Haldimand	1	3			1																							4
Halton	6		2																									8
Haliburton																												
Hastings			2					11	3				53	2														71
Huron	1	3	2																									6
Kent								11	5																			16
Lambton	5												1					1										7
Lanark	6		1					1	2																			10
Leeds and Grenville	2				5			1						1														9
Lennox and Addington	1		3				6	1	2				4	3														20
Lincoln	1					6																						7
Middlesex	7	3					1	3															2					16
Muskoka																												
Norfolk	8	2																										10
Northumberland & D.	4		1						2						1													8
Nipissing																												
Ontario	1																											1
Oxford	6	7	7			1	3	6	3													1						34
Peel	1					2																						3
Perth		1	7		1	2	4						1															16
Peterboro'			1						1																			2
Prescott and Russell	8	3	3			5	4	14	18				1	2	3													61
Prince Edward			1																									1
Parry Sound																												
Rainy River																												
Renfrew		1	2			1								1	1													6
Simcoe	1					2																						3
Stormont, Dun. & Glen.	4	1	10		5	12	11	1	2					3														49
Thunder Bay																												
Victoria	2		1				2																					5
Waterloo		3	4										1		1													9
Welland	4	5			3																							12
Wellington			3						1																			4
Wentworth	3	6	1		4				2	1	4			4														25
York	39	28	47			5	5	5	5	5	2		1	2	1			2										142
Total counties	27	16	20		10	9	10	14	13	4	3	2	8	10	6		2	2			1	2	3	1				...
Total cases	187	172	119		31	45	36	195	143	5	15	4	63	30	19		3	13			1	4	5	2				985

The incidence of the disease, as shown in the tables, was most marked in three series or groups of years, the first, that of 1871-74, being coincident with or following an epidemic prevalence of the disease in Great Britain. The years 1879 and 1880 were also marked by a serious mortality from the disease, as also the years 1884 and 1885. These two latter outbreaks are of much interest, showing by comparison how different were the results as regards general diffusion over the Province of the disease in the two periods, the one preceding and the other following the establishment of a provincial department of health.

That the disease reappears from time to time may be gathered from the following table showing the number of cases introduced into the Province during 1889-98.

Number of Smallpox Outbreaks, Cases and Deaths, 1889-1898.

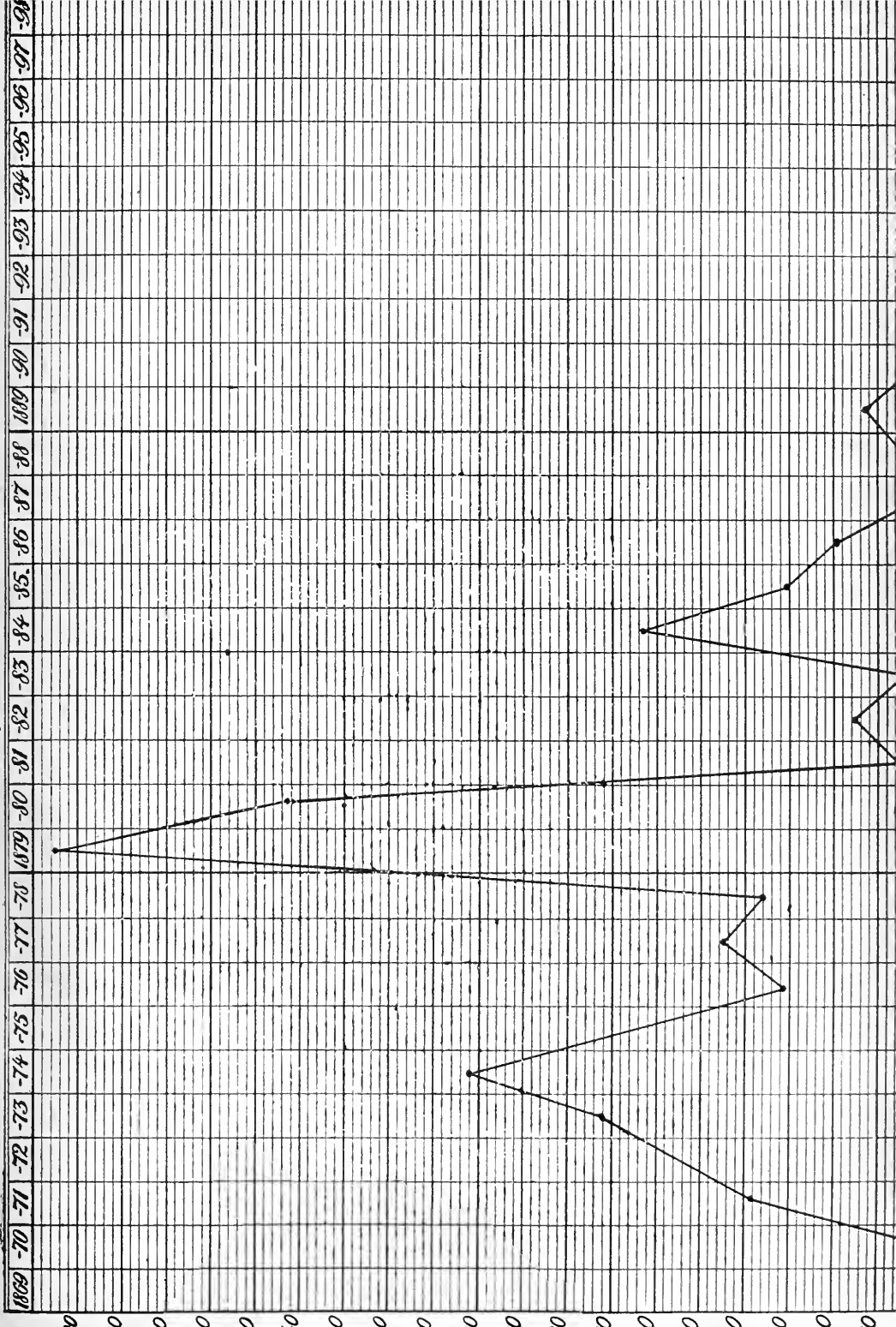
Year.	No. of outbreaks.	No. of cases.	No. of deaths.	No. of counties affected.	Remarks.
1889.....	2	47	13	2	One outbreak not early diagnosed; cause, infected clothing from Buffalo.
1890.....					
1891.....					
1892.....	1	2	1	1	
1893.....	2	9	3	3	In person of immigrants. Cases from Chicago and Detroit.
1894.....	15	36	5	5	
1895.....					
1896.....					
1897.....					
1898.....	3	13		2	From Detroit.

Of these outbreaks the three serious ones, that of 1889 in Elgin, was due to first cases being diagnosed as measles, and there being no isolation or vaccination till a general exposure and deaths had occurred, it appeared in thirteen houses. The only serious outbreak in 1894, there being fifteen distinct introductions during the year, was similarly due to a first mild unrecognized case, where protective vaccination of exposed persons was not performed.

The Elgin outbreak of 1895 was similarly due to a person, protected by vaccination, having had his clothing exposed in a ward in an hospital where a smallpox patient had been for a few hours. The remarkable fact is illustrated by the outbreaks of 1894, wherein fifteen distinct introductions of the disease occurred, that owing to early diagnosis, vaccination of exposed persons and isolation of houses, but thirty-six cases in all occurred, of the practical protection afforded by vaccination; whereas the twelve deaths in the Elgin outbreak of 1889 not only illustrate the intense contagiousness of the disease of smallpox since the first cases arose from persons at a country dance placing their wraps in a bedroom where two children sick, presumably with chickenpox, were recovering, but also the protective character of vaccination, since not a single one of the persons who died had been vaccinated.

In the succeeding chapter some of the scientific results which modern biological research have given us illustrating the reasons why vaccination has been so rich in its prophylactic effects will be dealt with; as in this has been shown the efficiency of a public health service in dealing with the disease. The resumé therein given will also serve to recall the services to humanity of a discovery which, made a hundred years ago, has in all civilized countries caused what was once the scourge of northern peoples to practically disappear as a cause of mortality. While outbreaks have not failed to make their appearance, the following diagram will make even plainer than tables the truth of the statement as regards Ontario.

Deaths from Smallpox in Ontario - 1869-1898.



CHAPTER II.

THE SCIENTIFIC BASIS OF THE PRACTICE OF VACCINATION AGAINST SMALLPOX.

Everyday experience of life teaches us that the memory of man is essentially short, and history is our teacher that in the political, social or moral sphere man is constantly repeating the mistakes of past centuries and as constantly devising some supposedly new scheme, in essence but a *fac simile* of some old idea, as a panacea for the evils which afflict mankind. To-day we have almost forgotten that smallpox was *par excellence* the scourge of past ages. Macaulay writing of the death of Queen Mary, wife of William III., says: "That disease over which science has achieved a succession of glorious and beneficial victories, was then the most terrible of all the ministers of death. Smallpox was always present, filling up the churchyards with corpses, tormenting with constant fears all whom it had not yet stricken, leaving on those whose lives it spared the hideous traces of its power."

Dr. S. Monkton Copeman in his interesting lectures, referring to a recorded outbreak of smallpox in 1722 in Ware, England, states that the population of the town was given as 2,515 of whom 1,601 are said to have had smallpox previously, the remaining 914 therefore being presumably susceptible to the disease. During the course of the epidemic, of those 914 persons 612 were attacked of whom 72 died." The antiquity of the disease is recognized since history informs us of the practice of how by taking smallpox crusts and by introducing them into the nostrils, the ancient Chinese and Hindoos produced inoculation against the disease.

Later this practice was introduced into England through the writings of Lady Mary Wortley Montagu. Writing from Turkey where she lived as wife of the Ambassador to the Court of the Sultan, she says: "The smallpox, so fatal and so general amongst us, is here entirely harmless by the invention of engrafting, which is the term they give it." So successful did the practice become in England that we are told 20,000 persons were safely inoculated by the two brothers Sutton, carrying out the method of procedure of the famous Sydenham, and without a single death. In practice, however, owing to the lack of any compulsory isolation of such patients the disadvantage resulted that inoculated persons became the vehicle of transmitting the smallpox to others who had not been protected against the disease, so that the total mortality from the disease was rather increased than diminished, the practice not having become general.

Such was the general situation when Dr. Edward Jenner, a student of the famous Dr. John Hunter, and a true scientific investigator, continued his lengthy observations on the protection against smallpox conferred upon the dairy-maids by their contracting cow-pox, a disease prevailing amongst the milch cows of the Gloucestershire district. On May 14th, 1796, it may be said he made the *experimentum crucis* when he inoculated the boy, James Phipps, by inserting lymph from a vesicle on the hand of Sarah Nelmes, a dairy maid, into two superficial incisions in the boy's arm.

It was yet left to Jenner to prove that the boy was proof against smallpox. Dr. Jenner in the following July inserted virus from a smallpox pustule by several similar incisions into the boy's arms. No disease followed. In 1798 Jenner published his investigations, which met with such marvellous public favor that within a few years the method had become known in every part of the civilized world.

So much for the fact of prophylaxis against smallpox having been established. The scientific question still remained: Is cow-pox or vaccinia the same disease in the cow as smallpox in man, only modified? Experimentation from 1801 till the present has gone on, and much discussion *pro* and *con* has taken place. Dr. S. M. Copeman in his lectures on the Natural History of Vaccinia tells how Gassner of Ganzburg in 1801, after ten fruitless attempts succeeded in inoculating a cow with smallpox, from which a series of vaccinations of children were made, each child in the two series proving refractory to

smallpox. Theile of Kasan in 1836 similarly succeeded in inoculating the cow with smallpox matter and in vaccinating children again from the cow. Badcock of Brighton carried on similar experiments through a period of 25 years, making 500 variolous experiments, and succeeded in establishing a regular depot for vaccine lymph, supplying it for thousands of children.

Later, however, the Society of Medical Sciences of Lyons began in 1865 a series of experiments, which seem to have proved that whatever lymph was got from any cases of successful bovine inoculation from smallpox patients was the smallpox lymph and caused true smallpox when inoculated into human beings.

In 1881 Voigt of the Hamburg Vaccine Establishment brought into extensive use in Germany vaccine from cows, due to a previous variolous inoculation.

Other similar experiments with similar results in different countries pointing to variations in results still leave as a matter of discussion the question of whether variola and vaccinia are the same disease modified by appearing in different species, or whether they are two distinct diseases.

Referring to the most recent experiments in which all the care due to antiseptic methods has been practiced we find that Dr. Copeman, in a series of experiments in 1892, succeeded in inoculating three calves with smallpox matter in succession, making them immune against vaccination with vaccine lymph, and in one of these obtained distinct vesiculation in several of the incisions. He also showed that by passages through a series of animals the lymph may become greatly modified. To quote Copeman's words: "The final result has, however, after a greater or less number of removes from calf to calf, been invariably the same—namely, a local vesicle is produced which by no means at our command, such as the appearance and course thereof or the protective power of the lymph derived therefrom, is distinguishable from true vaccinia."

On the other hand, Hervieux (1895), the director of the Vaccine Institute attached to the Académie de Médecine, Paris, asserts the only point of similarity between variola and vaccinia is in the likeness between the vesicles. Copeman, however, insists that if variolous matter can by a series of passages through calves be brought to a point where its lymph produces no more serious results than ordinary vaccine lymph, if it is equally protective against subsequent vaccinal inoculations and if its vesicles can in no possible way be differentiated from true vaccine vesicles, it may fairly be asserted that vaccinia, (cowpox) is nothing more than variola modified by transmission through the bovine animal. Perhaps he says "the most reasonable interpretation of such results may be that smallpox and vaccinia are both of them descended from a common stock."

We have hitherto dealt with the history of the relationship experimentally shown to exist between smallpox and cowpox, and shall now, making further use of various sources of information, refer to vaccine matter and its preparation. Calf lymph is somewhat more viscid than humanized lymph, and as observed under the microscope contains epithelial debris, a few cells being always visible. Leucocytes are usually present, notably in the mature vesicle, and a few red blood corpuscles may also be present.

Vaccine lymph, especially untreated lymph, stored in capillary tubes tends to become turbid or cloudy. This opacity, often like a central whitish thread in a clear fluid, culture experiments show to be bacterial colonies usually proportioned to the degree of opacity of the lymph, these colonies being especially of *aerobes* present in the lymph before storage in the tubes, which have subsequently developed in the lymph. The lymph or plasma of vaccine is at first faintly alkaline, but tends to become distinctly acid on storing after a length of time.

This serum contains, in addition to the vital activity of the specific organism peculiar to vaccine, an antitoxin or toxin—at any rate some product—possibly of the nature of a toxin or ptomaine which results from the vital activity of the specific organism peculiar to vaccinia.

What this organism is has been the study for years by many bacteriologists, and Copeman details in his series of lectures much of the work done and particularly that by

himself with Dr. Blaxall, in which it is stated that they were able to cultivate from the pulp taken from smallpox vesicles, inserted into an egg and kept in the incubator for a month, a very small bacillus by which inoculations made in calves produced vesicles which after passages through several animals produced a modified virus which was successfully used in vaccinating children, producing results in every way comparable to normal vaccinia. Both calves and children so vaccinated remained refractory to further vaccination with ordinary vaccine lymph.

Copeman further investigated the protective effects of both vaccine and variolous matter on monkeys, showing successful results, vesicles being about complete by the eighth day in each, that by variolous matter showing, however, more of a crust than the vaccine, and producing in some cases an eruption over the whole body. The constitutional effects were more severe with variolous matter, causing fever, diarrhoea, suffusion of the eyes and a peculiar odour.

Further experiments proved that whether vaccinated by vaccinal or variolous lymph, these monkeys proved immune to further vaccinations, even when performed months afterwards.

Until very recently, much later than in America, the practice of vaccination in England has been by arm to arm vaccination, but latterly an animal vaccine establishment has been instituted by the Local Government Board. The arguments for the use of animal vaccine are: (1) The general belief that arm to arm vaccination has become through years of transmission from person to person less protective through the nature of the lymph; (2) That other human diseases may be transmitted during the operation, such as erysipelas, syphilis and tuberculosis.

Inasmuch, however, as it has been found difficult to produce such animal vaccine from vesicles free from the presence of the ordinary pus microbes, attempts have been made since 1891, by Copeman and latterly by many others, to prepare lymph free from other germs, and the practice has now become common to prepare it for the double purpose of obviating any injurious results from their presence in inoculations, and, second, to prevent by their multiplication deleterious effects on the vaccine after being stored.

In 1896 a German commission, Dr. Koch with others, investigated the best means of preserving lymph, and in that report they state (1) that fresh lymph contains numerous microbes, whose number decreases on the addition of glycerine. Thus the commission found the streptococcus destroyed in eleven days and diphtheria bacilli in twenty days by this means.

They further found that the mixture of glycerine with distilled water could be employed to the extent of fifteen to twenty times the weight of vesicle pulp collected, without interfering with its value for vaccination purposes. Copeman and Blaxall further found that vaccine could in this way be freed from pathogenic bacteria, as those of tubercle and erysipelas, even when added in considerable quantities. This is when used in the strength of forty to fifty per cent. of glycerine. Mr. Copeman thus summarizes the advantages of glycerinated lymph:

(1) The method increases largely the amount which can be obtained without any deterioration in its quality to produce successful vaccination; (2) Glycerinated lymph does not dry up so quickly, thus simplifying the process of vaccination; (3) It does not coagulate in the capillary tube; (4) Glycerinated lymph can be produced absolutely free from the various streptococci and staphylococci usually found in untreated calf lymph; (5) The streptococcus of erysipelas, should it be present, is rapidly killed in the glycerinated lymph; (6) Tubercle bacillus is killed even if found in quantity; (7) The possibility of syphilis is eliminated; (8) The bacteriological purity and clinical activity of large quantities of lymph can be tested prior to distribution; (9) The readiness with which glycerinated lymph may be kept on hand for considerable periods of time without any practical deterioration makes its usefulness in any emergency, as where smallpox breaks out, apparent; (10) The expense of producing it is small since the amount obtainable from each calf is enormously increased.

The practice in the preparation of the lymph is after removal of the pulp from the vesicles to mix this with six times its weight of fifty per cent. solution of pure glycerine in distilled water, and thereafter store it in a cool, dark place week by week. Agar-agar cultures are made from it, each week showing a diminution of the microbes present until at the end of the fourth week the culture plates show no further development of colonies of microbes.

The duration of the activity of the lymph varies with the animal vaccinated, and upon the fineness of division of the pulp. Lymph stored for 32 weeks gave in 61 children vaccinated in five places a mean incision success of 98 per cent.

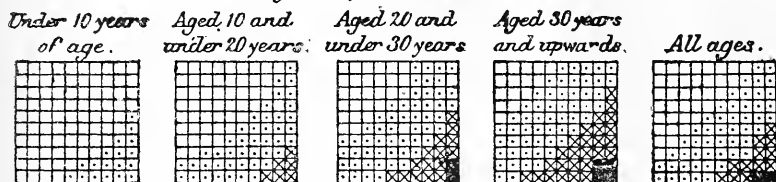
Of course, as Copeman remarks, all the stages in its preparation must be conducted with much care in order to procure these results. One of the chief requisites is that stables and laboratory be of such a character as to reduce the danger of extraneous organisms to a minimum.

Scientific methods having become developed to that point where vaccine matter is now obtainable in pure cultures, with an absolute certainty of successful vaccinations free from any mixed-infection or inoculation with pathogenic germs, we are in a position to demand of the public not only the recognition of that protection against smallpox from vaccination which as already seen has resulted since Jenner's discovery over a hundred years ago, but also a ready acquiescence in having a practice carried out in their families absolutely free from any of the possible dangers which its opponents have hitherto asserted have existed.

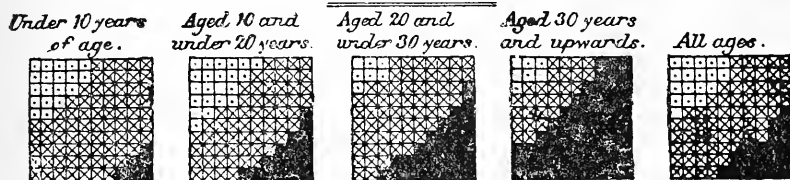
It is quite remarkable, however, how the outbreak of a case of smallpox in the Province, and the proclamation of compulsory vaccination, at least in the municipality where the case has occurred, calls forth the newspaper correspondent, who always quotes from pamphlets statements, which, perhaps excusable fifteen years ago, shew, in their very use of obsolete terms, antedating even the birth-day of bacteriological science, an absolute ignorance of the advances in the work already summarized regarding the preparation of aseptic vaccine, and of the relations which vaccination with it has, as regards its immunizing properties against disease, to the long series of perfectly demonstrated facts regarding the anti-toxine of diphtheria and the several other diseases in which serum therapy is looked upon as one of the most marvellous outcomes of modern biological science. Writing this report with a view to educating the public, as well as to strengthen the faith of any doubters even in the medical profession, there is introduced here a diagram so neatly setting forth the facts of the protective effects of vaccination, as referred to in the first chapter, that it is reproduced from Stevensson and Murphy's Treatise on Hygiene, taken from the Report by Dr. Barry, of the Local Government Board, England, on the Sheffield smallpox hospitals.

DIAGRAM showing the proportion of cases of Small-pox of different types which occurred in persons of the "Vaccinated" and "Unvaccinated" classes respectively at all and certain specified ages in the Winter Street and Sheffield Union Workhouse Hospitals

Borough Hospital, Winter Street.



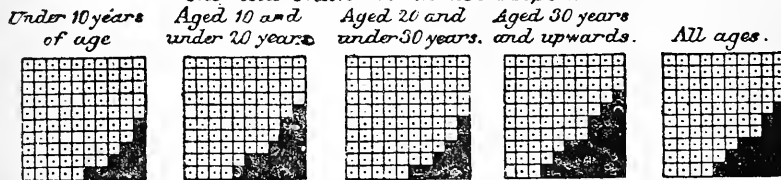
Vaccinated Class



Unvaccinated Class

■ *Confluent.* ☒ *Coherent* □ *Discrete.* □ *Varioloid*

Sheffield Union Workhouse Hospital.



Vaccinated Class



Unvaccinated Class.

■ *Confluent (including Coherent.)*
 □ *Discrete (including varioloid.)*

NOTE. Cases with regard to which the Hospital records were incomplete have not been included in this diagram.

As is remarked by the author of the extremely valuable article on smallpox and vaccination in that text book, the value of vaccination is to be learned, not only from the general absence of smallpox but from its occasional presence.

While such statistics as those set forth in the diagram are but the repetition of results everywhere, it cannot be overlooked that in view of the compulsory nature of the legislation regarding vaccination in Canada, as in most other civilized countries, the responsibility resting upon governments and all public authorities of supplying conditions under which the most absolute protection must be given to those to in whom the operation requires to be performed is beyond question. In a prolonged and very interesting discussion in 1897, introduced before the Medico-Legal Society of New York, by Dr. M. R. Levenson, the following was supplied by your secretary, as his summary of the present position of vaccination, the reasonableness of which the further work on serum immunity during the last ten years has seemed only to strengthen.

"Referring to the question in a five minutes' discussion, it may be broadly stated that compulsory vaccination has, in my opinion, passed both its medical and legal phases, and is simply one of many questions in "social evolution."

To orient the problem :

1st. The statistics of a century have absolutely demonstrated that by compulsory vaccination, smallpox has been, and can be eliminated from the category of diseases.

2nd. That even with a compulsory vaccination law imperfectly administered, varioloid is a disease less fatal than measles.

3rd. That the objections which have been taken to the practice of inoculating healthy persons with the materies morbi of attenuated smallpox, cannot be from the standpoint of a lack in its prophylactic efficiency ; but from (a) the dangers which may accrue to a patient of inflammatory complications during the progress of the vaccinia, and (b) of dangers due to impure vaccine lymph.

4th. Were there to-day practical objections owing to deaths resulting from either cause through the operation, it must at once be admitted that compulsory vaccination is vicious legislation, as contributing directly to the injury of the individual and therefore to the state and not to be defended.

5th. In practice, such objections do not exist, since with the preparation of lymph, under the direct supervision of trained bacteriologists, its action may be obtained in a normal manner without any lessening of its potency, while the absence of dangerous mixed infections in the lymph may be wholly prevented. The surgical operation is of all the simplest, and infection, through the operation, is to be set down to defective surgery.

6th. While, however, compulsory vaccination has, in my opinion, more than justified itself, the practical question of how the law should be applied is pertinent to the discussion. Were vaccination universal and systematic in practice, it would soon not be necessary, as the disease would be eradicated. Inasmuch, however, as immigrant and other travel keeps introducing the disease into seaports and other large cities with dense populations, the compulsory vaccination of school children as a routine measure is demanded.

7th. In Canada this has not been found continuously necessary in rural districts, though still carried out in many sections, owing to the fact that sanitary organization has attained a degree of development by which a centre of infection is promptly isolated ; persons within the radius of the infection are compulsorily vaccinated, and should accident have seemed likely to have caused many to be exposed, whole districts may under proclamation of the state or municipal authorities be at once brought under the operation of the compulsory Act.

8th. In conclusion, it may be stated that while in practice, with smallpox present or in the vicinity of any district, vaccination is carried out generally under compulsory law with penalties attached, yet it seems reasonable that inasmuch as the refusal in individual cases to have the operation performed, which may be due to personal fears of inoculation and is lacking in those qualities which would create a moral wrong, such refusal can be met successfully by compulsory quarantine of persons or families at their own expense during periods of immediate danger, and of enforcing non-attendance of unvaccinated children at school ; since the parents of such children have no right to claim educational advantages from the State which holds that compulsory vaccination of all school children, as in a large city, is necessary to the welfare of the State and the safety of its citizens.

But it is further of special interest and importance to illustrate how scientific methods are still further elucidating the fundamentally scientific basis of the practice of vaccination by showing that as in diphtheria, anthrax, bubonic plague, rinderpest, typhoid and other diseases, the presence of the disease germs or their toxins in the system of men and animals there produces what are called anti-toxins, which in some manner create a vital resistance of the system for longer or shorter periods to the disease, which has been introduced. Of this class of work relating to the immunizing effects of vaccination through the production in the blood serum of an anti-toxin to both vaccinia and variola or smallpox, I shall give the summary of some remarkable experiments carried on in Paris, France.*

The experiments and reports thereon are by M. M. A. Bédère et Chambon et Menard, directors of the Institute of Animal Vaccine, Paris.

The experimental study shows that the serum of a vaccinated heifer has some immunizing properties against inoculated vaccine. Such serum injected into an animal of the same species just before a number of subepidermic inoculations causes to some extent incomplete immunization, but yet sufficient to render sterile a large number of the inoculations made, to give the others a rudimentary and aborted appearance and especially causing such to lose all appreciable virulence of the lymph, since it will not inoculate either infants or heifers. The modifying of the virulence of the lymph is much more marked than the change in the appearance of the vesicle. This modification reveals itself even when the inoculation with lymph is delayed one or two days. Thus the serum exerts not only a preventive power but a curative power. Though still much more feeble than the curative power following later after inoculation from a vesicle, this immunizing action always shows itself very rapidly. The immunity conferred by vaccine virus on the other hand develops but slowly; indeed not till after eight days. It is only after the lapse of such a period that similar inoculations made remain sterile.

In the first experiments a definite amount of vaccine was injected under the skin, which was followed by a series of inoculations made on the skin in the usual way, with the interval of a day between, in the first heifer; then after two days, in the second; after three days in the third, and so on.

The following summarized give the results of the several experiments when the inoculation with vaccine was delayed three days: *Experiment 1*: A heifer received an injection under the skin of the left flank with the contents of a large tube of vaccine, formed of glycerinated pulp prepared ten months previously (the amount being about five centigrammes of boiled water, five centigrammes of glycerine and ten centigrammes of the pulp scraped from the vesicles.)

Three days after, the animal was inoculated with vaccine virus on both sides of the body, by linear incisions of two centimetres in length, three or four centimetres apart, to the number of 80 to 120 on each side.

At the same time a test animal injected was vaccinated in the same manner. In both the vaccinal eruption appeared after the usual interval, with normal appearances, practically the same in both. All the inoculations gave rise to vesicles. From both, two collections of vaccine lymph, twenty-four hours apart were taken. From both, also, a glycerinated pulp was prepared dating from the 4th, 5th and 6th day from the date of inoculation. Those from the test animal were considered as normal and used for comparison as to virulence of that from the injected animal.

To this end with proper precautions non-vaccinated infants were vaccinated with three punctures on each arm, on the right arm with one of the three normal vaccines and at the same time on the left arm with lymph of same date from the experimental animal. Five infants were vaccinated on the right arm with normal vaccine and, on the left with test lymph taken on fourth day; eight infants with lymph taken on fifth day and seven infants with lymph taken on sixth day. On all the infants the inoculations gave beautiful

*See Annales de l'Institut Pasteur, Nos. for Dec., 1898, Jan. and Feb., 1899.

vaccine vesicles, without notable differences on the two arms. There exists, therefore, no appreciable difference in the vesicles from the two sources and of corresponding age.

Experiment 2.—Where a heifer was injected with a glycerinated lymph of two and a half months standing; after four days this animal was inoculated with the same lymph in the manner already described. At the same time a test animal was vaccinated. The evolution of the vaccine vesicle in the two was very different. Three days after the inoculation the test animal not only does not show any swelling about the incisions, not even any thickening of the skin, and no redness; it still is in the incubation stage. At the same time the experimental animal shows an eruption manifestly premature, more advanced, even in its evolution, than another animal vaccinated twenty-four hours earlier. All its incisions are surrounded with a very marked red areola, indicating a strong congestion, the subjacent tissue is infiltrated to the point of forming a notable elevation to sight and touch. Six days after the injections beneath the skin, the eruption of the experimental animal is composed of large pustules, prominent, wide, filled with an opaque liquid, and surrounded with a zone of great congestion, several inoculations, however, being partly aborted.

These pustules are for the most part remarkable from their festooned contours and polycyclic, a certain indication that the inoculated germs have not developed fully and that each pustule is formed by the re-union of only a small number of sub-epidermic colonies, only, however, three or four. On the test animal the eruptive elements are much less large, less prominent, filled with a fluid still mostly transparent. Some, however, are opaque, without a congested tint at the periphery. They have regular contours, evenly outlined, and not appearing formed, as those in the experimental animal by the confluence of three or four vesicles first rounded.

From the experimental animal, at intervals of twenty-four hours, lymph is taken in three lots, and a glycerinated pulp is prepared in three lots, dating the fourth, fifth and sixth days after the sub-epidermic inoculations.

To measure the virulence of each of the three vaccines non-vaccinated infants were inoculated as before on each arm, the right with normal vaccine taken from the test animal six days after inoculation, the left with lymph from the test animal taken on the fourth day after inoculation; also infants with fifth and sixth day experimental lymph. On all the infants the vesicles on both arms show no differences. There seems, then, no difference in virulence in the two lymphs. It is notable, however, that the fourth day lymph gives vesicles particularly large and prominent, more beautiful than those coming on the same subjects from normal vaccine. It has, then, an accentuated virulence.

Experiment 3.—Made after a sub-cutaneous injection five days preceding the inoculation gave as results:

- (a) Matured vesicles twenty-four hours at least before the non-injected test animal.
- (b) Vesicles notably modified in external appearance and arrested in its development.
- (c) A lymph of normal virulence five days after inoculations, of very attenuated virulence after six days.

Experiment 4.—Made after an injection preceding by six days the inoculation giving as a result:

- (a) Vesicles developed about twenty-four hours sooner than the normal.
- (b) Vesicles very much modified in external aspect, rapidly and notably arrested in their development.
- (c) Vesicles containing a lymph of almost no virulence four days after inoculation, and of no virulence five days after inoculation.

Experiment 5.—The injection preceding the inoculation by seven days gave as results:

- (a) Vesicles appearing about twenty-four hours in advance of normal vaccination.

(b) Vesicles very modified in external appearance, rapidly arrested or aborted in their development.

(c) Lymph with almost no virulence four days after inoculation, and no virulence five days after inoculation.

These various experiments confirm the fact that the immunity following sub-cutaneous injection in its period of gradual development from the fourth to the eighth day shows itself externally by an arrest of development, more or less pronounced, of the eruptive elements. The proportion of sterile inoculations, or almost sterile, increases with the daily progress of the immunity and enables us to measure with the eye its increasing degree.

The experiments further show that with the arrest of the eruptive elements there corresponds an attenuation more or less complete of their contained lymph. With these signs are revealed and measured the gradually increasing immunity as the days follow the sub-cutaneous inoculation of vaccine virus.

In these two ways, also, has been revealed and measured the immunizing action, both preventive and curative, of the serum of a vaccinated heifer; this is not a single action *but comports in a series of varying degrees with the doses of serum injected and with the time of injection.*

The principal fact developed by these new researches is that in heifers successively injected under the skin and inoculated upon the epidermis, there results between the subcutaneous vaccination and the complete loss of virulence of vaccine lymph an interval of at least eleven or twelve days.

The same experiments performed on guinea pigs gave similar results.

The protective action of serum as shown by its effects upon the vaccine virus has been studied with the serum of convalescents from smallpox, from vaccinated horses, vaccinated men, and from animals inoculated with smallpox virus. All have been found to comport themselves similarly as opposed to activity of vaccine virus.

M. André Jousset, has studied the physical and chemical qualities of the special substance which gives this property to such serums.

It has been clearly proved that the serum from such vaccinated animals mixed with fresh vaccine at once renders it inert.

Thus a non-vaccinated heifer is aseptically bled by a puncture in the jugular. It is then vaccinated in the usual manner by multiple incisions. The eruption appears in the usual manner. Fourteen days after the vaccination it is bled a second time. These two bleedings yield two serums taken aseptically. A test-tube is almost completely filled with a sample of each serum of 5 to 6 c.c.

To each is added the contents of two or three tubes of vaccinal pulp of same crop. The tubes are carefully shaken, covered with rubber caps sterilized. They are then laid horizontally to aid complete mixing of serum and pulp. At the end of 24 hours they are shaken again, placed vertically and the pulp allowed to settle. After another 24 hours, by aspiration, almost all of the two test serums and the mixture of serum and vaccine pulp in each tube is placed in sealed tubes. Thus then are two vaccines prepared in the same manner from the two animals. To test their virulence, it is only necessary to vaccinate the same animal on different sides of the body. This was usually practised in the inside of either thigh.

Thus the left side was vaccinated with 15 incisions with vaccine treated with serum from non-vaccinated heifer, and the right side with that from the vaccinated animal. This animal is immediately vaccinated on the side of the belly with fresh vaccine virus which has not been in contact with any serum. After six days the eruption is at its height, the normal vesicles of the flanks show the receptivity of the animal. The vesicles on the perineal spaces may thus after another day has elapsed be accurately compared with the normal vesicles. It is found that the inoculations with lymph mixed with serum from the non-vaccinated heifer have produced perfect vesicles and have lost nothing

of their virulence. On the other hand, the vaccine mixed with serum from the vaccinated heifer has not produced any appreciable result, and practically no inflammatory action. Thus it may be said that the serum of the vaccinated animal produces on the vaccine virus most certainly anti-virulent effects, to say the least; in the same way as we speak of the antitoxic and the anti-venomous effects of certain serums.

Experiment in 36 cases on horses treated in the same manner as the heifer produced identical results.

Similarly, 30 experiments were made on human subjects. Each patient was bled, yielding 20-30 grammes of blood by a hypodermic syringe introduced into a vein of the arm.

The case of a woman 44 years old, vaccinated in infancy, is given. She was bled then three days after was inoculated on left arm by three incisions with fresh vaccine from the heifer, which gave beautiful vesicles, showing no trace of the immunity of infancy. Some 32 days after this vaccination, some blood was again taken from the woman. The serum taken from the patient bled, studied in its action on the vaccine virus, comparatively with that taken from the unvaccinated heifer, resulted as follows:—The left side of the perineum of an unvaccinated heifer is vaccinated with lymph treated with serum of an unvaccinated heifer, while the right side was vaccinated with vaccine treated with the lymph from the woman vaccinated a month before. The result was that the vesicles on the left side were perfect, and those on the right side were aborted as in the previous case of the heifer.

In the next experiments, the effects of mixing vaccine with serum from patients recovering from smallpox, were shown. Blood was taken from ten patients. Thus a man was bled on the 23rd day of the disease, the 20th from the beginning of the eruption. Some days later a heifer was inoculated as before with vaccine bottled for 48 hours, taken as above from the patient. Compared with fresh vaccine not so treated, the incisions showed the complete anti-virulent action of the blood serum. The same results exactly were got by vaccinating a child on both arms; the one with fresh vaccine, and the other arm with vaccine treated with lymph. The one arm had a perfect vaccination, the other produced no reaction whatever.

These experimenters further tested the serum of monkeys, which they succeeded with alone amongst lower animals in inoculating with lymph from vesicles in smallpox patients. On the fourth day after inoculation, the forty-one incisions became papulo-vesicular, very similar to those of vaccinated children on the fourth day.

The inoculated monkey became sick and died on the 14th day after the inoculation. A few minutes before it died, blood was taken from its femoral artery, giving some 2 c.c. of serum.

A heifer was vaccinated as before on the right side with vaccine treated with this serum; the other side with fresh vaccine. The result was as before, the treated vaccine proved non-virulent.

The lymph from a smallpox vesicle in a woman who had smallpox, and who had been injected with serum from a vaccinated heifer as a therapeutic measure—forty-eight hours before the lymph was taken—proved ineffectual in any attempt to inoculate a monkey with smallpox.

These experimenters have further shown that while they could not inoculate horses and other animals with smallpox by the skin like the monkey, yet by injecting them into the cellular tissue with smallpox lymph, the blood-serum afterwards proved sufficient to make vaccine virus inactive.

Experiments with the serum of vaccinated animals showed that its anti-virulent action was not destroyed by heating to 70° C; and further that its properties were not removed by filtration through a Chamberland filter; and further that the vaccination of the mother shortly before the birth of a child, makes the child immune to vaccine virus.

Summed up, the conclusions of this most interesting series of experiments are :—

1st. The serum of a heifer taken fourteen days after inoculation, is endued not only with immunizing properties, preventive and curative—but it also produces when mixed with vaccine, an anti-virulent effect.

2nd. It produces in horses and probably similar animals, the same anti-virulent properties as in cows and men.

3rd. Vaccination produces the anti-virulent property on the serum, however the inoculation be made, whether by the skin, the blood, or the deeper tissues.

4th. The serum from convalescents from smallpox exerts the same anti-virulent action on vaccine as does that from variolized animals, as monkeys.

5th. The anti-virulent substance of the serum of man and animals immunized against vaccine and variola has a stable composition, offers great resistance to heat, light, time, persists when dried and does not readily putrefy.

6th. The blood takes several days after inoculation to acquire anti-virulent properties fully, in the heifer after from nine to thirteen days, and is at the very moment that the vaccine or variolous virus loses all activity.

7th. The period of vaccinal immunity varies much with different species, but the anti-virulent property of the blood goes on decreasing, and may disappear completely, although the skin in the same person may still resist re-inoculation with vaccine.

8th. This anti-virulent property varies with different persons, but persists for twenty-five years and even fifty or over, with persons against variolous and vaccinal infection.

9th. The production of the anti-virulent substance in the course of vaccinal or variolous infection and its appearance in the blood plasma, constitute a reaction of defense of the organism intimately allied to the arrest of the morbid process, and to the development of immunity. We do not yet know whether this substance acts directly on the infective agents as a virulicide or whether it acts as a stimulant on the tissue cells of the organism.

CHAPTER III.

VARIATIONS IN THE VIRULENCE AND INFECTIONOUSNESS OF PATHOGENIC MICRO-ORGANISMS.*

When we consider the infectiousness of a micro-organism or the gravity of the manifestations of its virulence in an infected animal, we recognize at once, that there frequently exist wide variations in intensity. These variations may be due to either a difference in the resistance of the infected organism, that is to a variation in immunity, or to a greater or lesser degree of power to infect, that is to a variation in the virulence in the virus.

That natural immunity may vary considerably is well known, and that unfavorable hygienic conditions of all kinds are potent influences in diminishing this natural immunity is also recognized; but in many infectious diseases, epidemiological studies show that the more important factor in determining the morbidity and mortality is the virulence of the virus.

It is true that the two conditions of immunity and virulence act and react on one another, and in many instances may be separated with difficulty. We must admit that an organism of low virulence may infect an animal with slight natural immunity, whilst the same organism would not infect another animal with marked natural immunity; but if we take such a specific instance as the history of diphtheria in England during the present century, we see that, in spite of improved hygienic conditions, the mortality rate, until the introduction of anti-toxin, has varied but little, and whatever variation has occurred has been more cyclic in character, rising gradually through a series of years to a maximum, then falling to again rise.

If we look more closely into the history of diphtheria, we see everywhere evidence of this variation in virulence of the diphtheria bacillus.

The percentage mortality of diphtheria in Europe, without anti-toxin treatment is undoubtedly higher than in America, notably higher than in Ontario. Looking at European statistics as a whole we find a mortality rarely under thirty per cent, and frequently as high as thirty-seven per cent. On the other hand Ontario statistics show a much lower mortality even with our undoubtedly incomplete morbidity returns. But in Ontario itself we find great variations in different cities and towns and in the same town in different years.

If we take, for example, the statistics of such a city as Brantford, in which notification has been fairly thoroughly carried out, we find the following results:

For the years inclusive of 1890 to 1895 there were 384 cases with 49 deaths, or 12.07 percentage.

For the individual years the returns are:

	Percentage.		Percentage.
1890	11.5	1893.	11.1
1891.....	15.0	1894.....	13.8
1892.....	4.0	1895.....	21.1

As a rule the percentage mortality in Ontario is under twenty, but occasionally we find that it runs much higher, for instance:

Hamilton.	Per cent.	Ottawa.	Per cent.
1893.....	25.5	1892.....	30.0
1891.....	37.5	1894.....	29.9
		1895.....	27.9
Stratford.	Per cent.	Stratford.	Per cent.
1891.....	46.1	1892.....	25.0

*By J. J. Mackenzie, B.A., Bacteriologist to Provincial Board of Health.

The only explanation of these variations is a difference in virulence in the infecting bacillus.

From time to time the diphtheria bacillus has been isolated in pure culture from cases sent in to the laboratory for diagnosis, and I have tested the virulence of the pure cultures for guinea pigs. It is, of course, impossible to draw exact conclusions from the virulence of the bacillus for guinea pigs, as to its virulence for man, as many experiments have shown that this is unsafe; but the facts are interesting as indicating the extent of variation. The results are as follows:

Experiment A.—Specimen isolated from a larynx at an inquest, two weeks after burial :		
Dose.	Weight of guinea pig.	Result.
1 c.c. 48 hour bouillon culture	450 grns.	Death in two days.
Experiment B.—Specimen isolated from an infected throat three months after the disappearance of the membrane :		
Dose.		Result.
1 c.c. 48 hour bouillon culture		Death in two days.
Experiment C.—From mild case of diphtheria, with very slight exudate :		
Dose.		Result.
0.5 c.c. 48 hour bouillon culture		Death in five days.
Experiment D.—From case of otitis media (disease of middle ear) :		
1 c.c. 48 hour bouillon culture	Induration at point of inoculation ; animal recovered.	
Experiment E.—From infected nose (A. M.) ; no clinical diphtheria ; no discharge from nose :		
0.99 c.c. 48 hour bouillon culture, weight of guinea pig 500 grms	Animal died on 15th day. Extensive necrosis of skin.	
Experiment F.—From mild diphtheria A. B. :		
0.99 c.c. 48 hour bouillon culture, weight of guinea pig 500 grms ..	Animal did not die, lost weight and had extensive area of necrosis of skin.	
Experiment G.—From nasal discharge S. U. :		
1.09 c.c. 48 hour bouillon culture, weight of guinea pig 500 grms.....	Animal died in 18 days.	
Experiment H.—From slight sore throat, U. K. :		
0.99 c.c. 48 hour bouillon culture, weight of guinea pig 500 grms.....	Animal died in 18 days.	
Experiment I.—From infected throat :		
0.98 c.c. 48 hour bouillon culture, weight of guinea pig 500 grms..	Animal lost weight and showed extensive infiltration of skin but did not die.	
Experiment K.—From severe laryngeal diphtheria :		
1 c.c. 48 hour bouillon culture	Animal died in 48 hours.	

It will be seen from these results of experiments that for the guinea pig there may be a very marked variation in virulence. All these animals were given approximately the same dose of the culture of bacilli, yet the results were quite different. As a rule we notice also that the most actively virulent cultures came from the most severe infections in man.

When we turn to the bacillus of typhoid we find the same variations in virulence.

In epidemics of typhoid in Ontario we see that the mortality varies considerably in different epidemics and in some instances quite markedly. If we take specific instances, we may refer to two rural epidemics, investigated by the writer which show markedly the effect of virulence. The one occurred in the Township of East Zorra in Oxford County, in October, 1897, the other in the Township of Hamilton, Durham County, in the autumn of 1898. In both cases, it was impossible to trace the origin of the first case but the relationships of subsequent cases were easily traced. In both cases hygienic conditions were apparently the same, the population attacked were of the same class and apparently endowed with the same degree of immunity, that is they belonged to a well-to-do farming class. The East Zorra epidemic showed eighteen cases and eight deaths, the Hamilton epidemic showed twenty cases and one death. As pointed out in the report upon the East Zorra outbreak the most striking characteristic aside from the high

mortality was the evident infectiousness of the virus ; in the Hamilton epidemic, the mortality was low and there was not so much evidence of direct contagion, the cases seemingly being traceable rather to polluted water. These facts, then, intense virulence and intense infectiousness seem to go hand in hand and *a priori* one would expect such a connection.

There are many other instances of variation in virulence which might be given but the above will suffice.

An important question from the standpoint of public health is that of the causes of these variations. What are the conditions which determine them ?

Some of these we know from the results of experimental investigation, but all the conditions are not yet thoroughly understood. There seems to be no doubt but that the tendency of pathogenic bacteria is to lose their virulence when allowed to grow outside the body ; that the longer they have grown outside the body the lower their virulence and that once lost it is regained with difficulty. All sorts of conditions produce this. Thus simple cultivation in the laboratory is most effective ; a temperature higher than the optimum for their growth, the presence of substances in the culture medium which tends to weaken the growth. To restore lost virulence on the other hand is a still more difficult problem. The method which is usually adopted in the laboratory is its passage through the animal body. Pasteur found for example that in rabies the virus from dogs, infected with the so-called street virus, varied considerably in virulence. Inoculated into rabbits it produced death in from fifteen to thirty days. When, however, the virus was passed from rabbit to rabbit, the incubation period became shorter, and death followed in a shorter time, until finally a degree of virulence was reached in which the animal invariably died within eight days. This condition remained constant, that is the virulence had reached its acme or it was fixed.

The same observations have been made for the streptococcus. Passage from rabbit to rabbit increases the virulence so that finally a stage is reached where a single cell or microbe is sufficient to produce a fatal septicæmia in the animal.

For typhoid, diphtheria and other diseases, the same fact has been experimentally established. Passage from susceptible animal to susceptible animal will apparently always increase the virulence of a micro-organism.

This fact is a most important one from a public health standpoint ; the rapid spread of an epidemic disease through a susceptible population always results in an increase in virulence of the disease. Many epidemiological observations give support to this view, the most characteristic being the spread of such diseases as measles, smallpox and syphilis amongst aboriginal races. Whenever this has occurred the virus has increased enormously in virulence, not only for the relatively susceptible aborigines but also for the immune white races who may be exposed to the disease. When, therefore, an epidemic disease breaks out in any community the necessity for checking it is two-fold, primarily to lessen the number of cases and secondarily to prevent any possible increase of virulence, due to the rapid passage of the virus from individual to individual.

Aside from the above normal increase in virulence which results from passage through animals we sometimes meet with cases in which there seems to be a sudden increase which is not so easily explained. An example of this is shown by the recent epidemic of smallpox in Ohio. In over a thousand cases the mortality has been less than one per cent. The disease has been so mild as to lead to its being repeatedly overlooked by experienced physicians. The virus from this outbreak, however, has been introduced into Quebec and the French counties of Ontario, with the result that there has been an outbreak of typical smallpox with the usual mortality. Vaccination to a certain extent may account for some of the difference in the virulence of the virus in Ohio and Quebec, but not entirely.

This fact, then, of the gradual or sudden increase in virulence must always be kept in mind when an epidemic occurs, since should it appear, the difficulties of the health officer and physician are correspondingly increased.

Especially do we see the practical utility of thorough isolation of even mild cases of disease, as of scarlatina and diphtheria ; since the contagion spread from child to child, that is from mouth to mouth is as from animal to animal, and therefore possesses a virulence greater than inoculation from infected clothing, or from the air of an infected house. In the latter case many interesting illustrations could be cited of public buildings, such as orphanages, institutions for the blind, and children's hospitals, the air of which, owing doubtless to microbes being present in the dust on floors, walls, etc., seems to be permanently infected. But meanwhile the microbes have become so weakened in virulence in their existence outside the body, as to cease almost to be infective to the inmates, but which will only too readily attack those children who may enter the home, and which have not as it were become immune to infection from that particular atmosphere. This immunity which may be called house acclimatization is on a par with that gradual acclimatization which takes place in the residents of malarial climates, and indicates the aptness of what was stated in the beginning of the chapter, that there are necessarily the two influences acting and re-acting upon each other, viz. : that of virulence and of immunity, both of which are of necessity terms purely relative.

CHAPTER IV.

THE BIOLOGICAL PRINCIPLES INVOLVED IN THE PURIFICATION OF THE SEWAGE OF TOWNS.

While the comparatively small populations of the towns and cities of Ontario, and their location in most cases on the shores of the great lakes and rivers have hitherto made the question of the pollution of streams of relatively little importance, compared with that in the densely populated countries of the world, and of the older industrial States of the American Union, yet the fact that the urban populations of the thirteen cities of Ontario alone amount to 436,000, while but fifty towns and cities are more or less sewered, clearly indicates that the laws against the pollution of streams, contained both in the common law of Canada and the Public Health Act have served and will hereafter still serve to prevent the development of conditions which older countries have found to be the problem most difficult of solution with which urban municipalities have had to deal.

The primary cause in the creation of the problem of sewage disposal has lain in the fact that the waste organic materials from man and animals have been looked upon as having no commercial value commensurate with the cost necessary to their transportation, either as to the land or to their manufacture into any commercial product. Especially has this been true in new countries, such as Ontario, where the virgin fertility of the soil was for many years deemed adequate for yielding, without the cost consequent upon the use of manures and other fertilizers, crops giving a good financial return for the labor involved.

The agricultural experience of the last twenty-five years in the older settled parts of the Province has, however, shown how serious has been the mistake made, and to-day we see that the agriculturists and horticulturists near the larger centres of population are taking every opportunity of using, to their fullest extent, all town refuse, whether manure or offal and waste from various industries, to restore to the soil its lost organic and mineral constituents so necessary to intensive cultivation. The cities of the old world, both of Europe and Asia, have, however, largely added human organic wastes to this class of soil fertilizers, and the Western states of the United States have seen the successful introduction of the Chinese methods in market gardening, wherein nightsoil plays so important a part.

In all this matter, however, we have seen on the part of the agriculturist an absence, first, of an appreciation of the value of and need for such fertilizers, and further, a notable ignorance of their value, and perhaps a still greater dislike to their utilization.

Under such circumstances, it is clear that there has not been cultivated any idea on the part of urban populations of doing anything towards the disposal of town refuse and sewage, except that of adopting the cheapest possible methods for its disposal, compatible with a due regard either for their own safety or the law against pollution of streams. Indeed, we cannot be said to have got beyond this stage since we see our two largest cities, Toronto and Ottawa, discharging all their sewage into Lake Ontario in the one instance, and into the Ottawa river on the other; and it has only been within the past two years that, under legal compulsion, we have seen Hamilton introduce chemical purification sewage works, and London preparing to dispose of her sewage on a sewage farm. The towns of Berlin and Waterloo, situated inland on mere creeks, have been forced to adopt disposal on sewage farms, and it has been only within the past few years that the Government public institutions have instituted methods for dealing with their sewage.

In Ontario, therefore, as in England and elsewhere, the introduction of methods for dealing with town sewage, other than the pollution of water courses, has been and must be, in the nature of things, gradual, being determined in the case of each town by either

a fear of the pollution of its own water supply, or by compulsion through legal action brought by another municipality affected by such pollution, as occurred in 1898 in the case of the city of Stratford.

With a view to encouraging the evolution of sewage disposal works, it therefore seems proper that a chapter should be devoted to the biological principles involved in such.

By "sewage" is meant the liquid contents of a sewer; and, in water-closet towns this means of all human excreta, kitchen slops, washing water and the organic wastes carried to the sewers by storms, from the streets and lanes. In most, indeed in all towns, it means stable drainage, industrial wastes, such often as blood, and even offal from slaughter houses in some cases, and chemicals and refuse from woollen factories, tanneries, gas works, breweries and distilleries and the multiform industries of large towns.

It is, therefore, very apparent that sewage will vary greatly under different circumstance; and indeed, it is this fact which constitutes, as we shall see, one of the chief difficulties in disposing of sewage satisfactorily. Organic wastes, such as wastes from woollen factories and paper mills serve to clog filters rapidly, while gas liquors and other chemicals will at one time tend to destroy the living organisms or microbes which break up organic matters or at another time by their excessive acidity or alkalinity, seriously alter the conditions under which a filter normally performs its work.

In all such instances, however, it is apparent that special measures will have to be adopted for dealing with the sewage at the outfall works at such hours as the discharge from establishments of the kinds indicated arrives there. After all, essentially however, the problem of sewage disposal is one of dealing with the wastes from human habitations, which material may be said to consist of the following constituent parts, along with the mineral matters commonly reaching a sewer.

The analysis of the sewage of an average English town is given as follows :—

1. Solid matters in suspension :		
(a) Organic.....	20	grains per gallon.
(b) Mineral ..	10	" "
Total.....	30	" "
2. Solid matters in solution :		
(a) Organic....	20	grains per gallon.
(b) Mineral.....	50	" "
Total.....	70	" "

Or expressed in parts per 1,000,000, such a sewage would yield :

Total solids.	Solids in suspension.	Chlorine.	Free ammonia.	Organic ammonia.
1428.0 parts.	428.0 parts.	120.0 parts.	50.0 parts.	10.0 parts.

It will be apparent that the solids in suspension may be quite readily removed in large measure by any crude filtering methods, which may obstruct their onward flow; but that the organic matters in solution must naturally require such treatment as will either obstruct their movement toward the stream toward which the sewage water will ultimately flow, or destroy them by altering them in chemical form will at once be apparent. Besides this there are soluble chemical salts such as the chlorides which are only with difficulty removed from sewage even if it be filtered through soil.

In addition however to the constituents of sewage already given there are microbes or micro-organisms, which are carried into sewage with the excreta of human beings, as either normally or abnormally present in the intestines, as well as various species from the sundry organic constituents of household refuse. In addition to these are, however, the very many other species naturally present in the soil and refuse of streets, lanes, and so on, all of which once carried into the sewers will multiply there, if there be no conditions or substances present inimical to their existence as saprophytes. Besides these there are the various forms present in the air, which always occupies a notable part of the area of sewers.

It is therefore quite manifest that the mineral and dead organic matters in sewage, while forming its major part so far as bulk is concerned, may be, and indeed have in fact proved to be, the least important matter with which we are concerned from the public health standpoint. This is due to the facts, first, that the micro-organisms present in sewage may be in themselves pathogenic or actual producers of disease if taken into the human system either through air or water, and second, that such organisms whether disease germs or not may become saprophytes, growing and multiplying in sewage and there producing organic chemical substances which if taken into the system either through the air or water may prove to be actually toxic to the human or animal system.

The problem then of sewage disposal may be said to be simply: *How shall the organic matters present in sewage be so disposed of with the least cost, as that they shall not create effluvium nuisances either on the surface of the soil, along the banks of streams, or by their excessive presence in the waters of streams; or that they shall not pollute the water of streams which may be drunk either by man or animals with injury to health as the result?*

In order that such a question may be answered intelligently and correctly, it will be necessary to discuss the question of how pathogenic germs are removed from or destroyed in sewage, and of how the organic matters therein are by decomposition reduced to their simpler constituents, as either gases or soluble and insoluble chemical compounds. This process is what has very properly been called by W. D. Scott-Moncrieff, *The biolysis of sewage*, depending as it does principally upon the action of living organisms. He says, "*The problem may resolve itself into the discovery of the methods by which nature can be so aided in the case of sewage that it can be purified on the largest scale at a reasonable cost without creating a nuisance and without the use of chemicals.*"

The biolysis of barnyard manures applied to the ground as fertilizers affords the most familiar example of the destruction of the organic excreta of animals.

The following experiment (in a printed report of the chemist of the Dominion Experimental Farm) illustrates what takes place. He states that equal parts in weight of cow and horse dung were mixed and exposed to the amount of 8,000 pounds, in the open air in April. At the end of the month the manure had been reduced to 5,113 pounds. The organic matter was reduced from 1,938 to 1,093 lbs., or 45 per cent. of the total amount. The total nitrogen present, the total solids being but 30 per cent. of the total weight, was 48 lbs. or about 0.60 per cent. was reduced by 12 lbs. or 25 per cent. during this period. By this decomposition it is stated humus is formed, this being the name applied to semi-decomposed vegetable matter and is that which constitutes the black material in all fertile and productive soils. In a soil rich in humus it is found that micro-organisms are present in immense numbers per gramme of soil, decreasing downwards and that they carry on the decomposition of such organic matters as in virgin soils and manure until ultimately such would become but little more than mere carbon. It is thus seen that the multiplication of such organisms depends upon the presence of abundant organic matter and upon oxygen of the air.

We now know, however, that organic animal matters containing especially nitrogenous matters are capable of being decomposed apart from the presence of the oxygen of the air; in other words such materials may be broken up in water, after the dissolved oxygen has been exhausted by oxidizing processes and appropriated by aerobic organisms.

Mr. Thos. Fuller in his report on Water Purification states regarding the biological principles involved in sand filtration: "*This aspect is of practical significance by virtue of its action in removing organic matter which, in places beneath the upper surface accumulates as films around the sand grains. The removal of organic matter by oxidation and nitrification appears to be a factor in causing indirectly the death of bacteria, which are mechanically arrested by the adhesive action of the sand grains. By some it has been claimed that the bacteria go into a gelatinous form, the zooglea stage; and being attached to the sand grains, they facilitate thereby the removal of bacteria in the active vegetable stage, and of minute suspended particles by means of adhesion.*" As to the

varieties of bacteria in sewage we may gain some idea from the fact that Fuller differentiated 27 distinct species of bacteria in the Ohio river water, which, if pumped, would subsequently pass into the sewers carrying in addition all additional micro-organisms picked up by the water in its manifold uses in a city. There were in addition 64 other microscopic species, including diatoms, fungi, infusoria, etc.

From this summary it will be evident that, given organic matter as food, and the many varieties of microscopic beings present in it, we have only to allow nature's vital processes to go on unchecked, favouring them further as we may in various ways, and we shall find that all or many of such organisms, as indicated, will, by their multiplication, feed upon the organic matters in sewage and thereby reduce it to its simpler elements. We may thus further understand how, for instance, quick lime added to sewage in quantity, being an active germicide, would be likely to notably retard such biolysis, while the creosote and carbolic acid products from the tar of gas works, the tannic and other acids from tanneries, with arsenic and other chemicals, might equally prove extremely fatal to these processes of purification of sewage by natural processes.

Assuming, however, that these various causes detrimental to biological processes are dealt with specially on the premises where they are created, it will be apparent that as no living organisms of any two species have exactly the same life processes that at various stages in the reduction of sewage to its simpler constituents the environment will become more favourable to the activity of this, then more favourable to the other organism. Such indeed has in practice been found to be the case, and the most recent practical methods for dealing with sewage by bacteriolysis or biolysis have been adopted with a view to favor successive series of biological processes by different micro-organisms. Mr. Scott-Moncreiff thus arranges the sequence of acts in the biolysis of sewage: (1) The process of purification by biolysis is not instantaneous but gradual. (2) Dividing it into any convenient number of stages or periods, each of these must represent a different character of food supply. (3) No one kind of organism is capable of flourishing in all the different media or stages equally well.

It must be apparent that given a knowledge of the several stages and of what normally takes place in them, much may be done either to accelerate, or to retard the work, or even reverse the natural order of biological processes. As we have long known in the filtration of water supplies, it has been a comparatively easy thing to remove suspended matters, but a very difficult thing to remove those in solution. Mr. Scott-Moncreiff now, however, makes the assertion *that the process of throwing organic matter into solution was even more easily carried out than that of getting rid of the suspended matters*—formerly removed mechanically and by the addition of precipitants.

He further states *that the question altogether hinges not upon the amount of the organic matter in solution, but upon its instability and susceptibility to further and rapid changes in the direction of complete mineralization.*

To illustrate his meaning we can best do so by referring to his experimental filter. He constructed a filter (see diagram) $2\frac{1}{2}$ feet wide, 10 feet long and 3 feet deep at deepest part. This received the entire sewage and wastes of a household of ten persons, excepting the grease, which is held back as far as possible by a grease trap. The liquid rises through a grating, and then through stones till it reaches an overflow pipe. The filtering materials are only 14 inches deep. He found in different installations of the apparatus that practically complete liquefaction of the organic matter could be obtained, and that the amount of sludge remaining amounted to almost nothing. It may be stated, as I have learned with a filtration tank operating now for ten years, that the same decomposition of organic matters is effected in a covered tank, with the overflow pipe draining off the fluids half-way down in the tank. At the end of the year the sludge remaining does not amount to over a few pounds, grease, paper and other vegetable fibres being broken up almost equally with the sewage. The final disposition of this liquid sewage in this case has been by sub-surface tiles. Mr. Scott-Moncreiff pushed his experiments to determine how rapidly and most simply the further decomposition of this material could be carried out. He found

DIAGRAM ILLUSTRATING EXPERIMENTAL TANK OF W. D. SCOTT-MONCRIEFF.

FIG 1

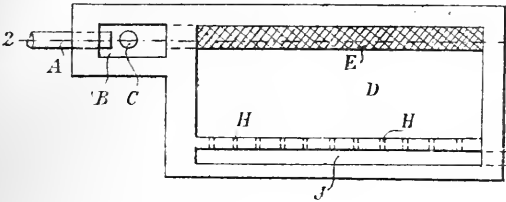


FIG 4

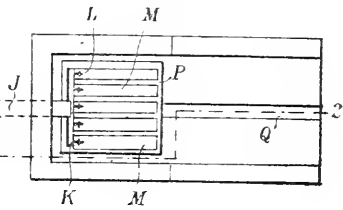


FIG 2

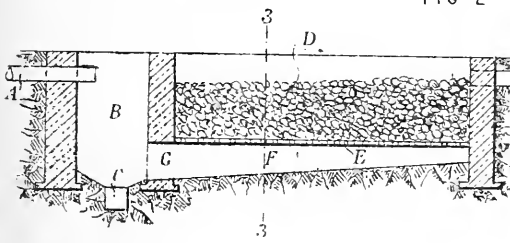


FIG 5

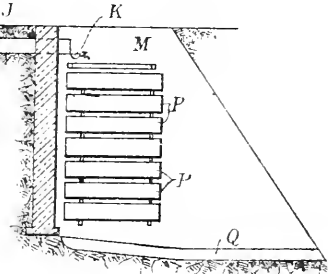


FIG 3

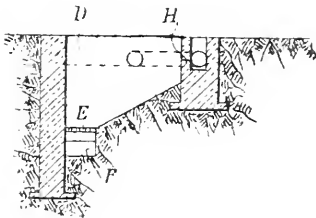
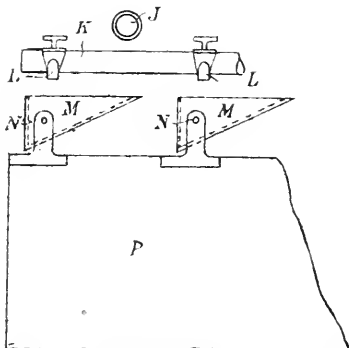


FIG 6



when this effluent went into a stream that while with the chlorine constituent as a measure of dilution, the latter was as 3 to 1, the loss of albumenoid ammonia was as 7 to 1, or in other words was very rapidly oxidized in the stream.

What was apparent then was that so far the oxygen in the water had first been utilized by organisms in the oxidizing process in the sewer before the sewage reached the tank and that afterwards other anaerobic organisms continued the work, utilizing all the combined oxygen of the organic matter itself. Mr. Scott-Moncrieff thereafter devoted himself to determining conditions most favorable for pushing the process of decomposition of nitrogenous matter still further. To this end a series of nine boxes, each filled with coke (inch size) to a depth of 6 inches, was arranged one above the other, and by an automatic tip tank the top received sewage pumped from the tank which passed successively through the nine boxes 6 inches apart. From under each a series of test samples could be taken at any time. The apparatus was kept constantly working for the three months to test the tendency to clogging of the coke. With the effluent running at the rate of a little more than 1,000,000 gallons per acre analyses were made by Dr. Rideal. The table of results is most remarkable as illustrating the same process which went on in the disintegration of barnyard manure, in other words the oxidization of nitrogenous products as seen in reduction of nitrous nitrogen from 0.99 in first tray to none in trays 10, 11 and 12 and of the increase of nitrates from 0.096 in first tray to 9.0 in tray 12. This remarkable conversion of products occurred in rather less than ten minutes showing the marvelous rapidity of the process.

Now by transposing the trays so as to upset the natural survival of the organisms in the different trays in the sequence, the whole process was arrested, a high colored and inferior effluent being the immediate result, and one or two days were required to re-establish the condition which had been disturbed.

Such then are the experimental results involved in sewage precipitation. As regards these results from the chemical standpoint there have been really two steps, first the attacking of the organic matter alone and second the breaking down of the ammoniacal nitrogen formed, it being changed finally into nitrates by oxidization.

Prof. W. E. Adeney, Royal University of Ireland, calls the two stages, those respectively of carbon-oxidation and nitrogenous-oxidation, and finds that the first stage is complete before the commencement of the second. From this it would appear that the stages of the process are the same in the purification of sewage whether or not the aerobic treatment takes place in the same filter where anaerobic action goes on or in a filter after the previous anaerobic process in a closed tank as that described by Mr. Scott-Moncrieff and now commonly called the septic putrefaction tank. Remembering, however the presence of oxygen in a natural water and that the air of properly ventilated sewers contains it in abundance it will be apparent that the aerobic stage is necessarily present in sewers before the sewage has reached the sewage works at the outfall.

The application of the septic tank principle to the purification of sewage on a large scale as at Exeter, England, is that illustrated by the diagram of the Scott-Moncrieff tank, wherein the entire sewage is submitted in an air free dark space to the liquefying action of anaerobic bacteria, a process daily seen in the laboratory test tube when gelatine culture media are liquified by microbes beneath the surface. Indeed Dr. Sims Woodhead has found that in 1 c.c. of Exeter crude sewage there were one million organisms which were anaerobic and five and a half millions which were aerobic. Of the 1,000,000 anaerobics 300,000 were found to be liquefying organisms and of the five and a half aerobics 500,000 were liquefying. From these, as may readily be seen in the laboratory, are given off carbonic acid, ammonia and other volatile gases. The Exeter septic tank has never been cleaned out, yet rags, paper, straw, feathers are gradually liquefied. Chemists have indeed found and named special ferments which attack and destroy cellulose both in the intestines of animals and in laboratory experiments. Further we have the specific microbe termed *B. amylobacter* always found in putrefying processes and attacking or hydrolysing sugars, starches and cellulose and producing as by-products butyric acid and hydrogen and is essentially anaerobic. The chemist, Mr. S. Rideal, London, has

Table showing successive stages of Mineralization by Nitrifying Organisms.
By W. D. Scott Moncrieff.

Ashstead Experiments, February, 1898.

Description of samples.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
	Chlorine.	Free NH ₃ .	= N.	Albuminoid NH ₃ .	= N.	Oxygen consumed.	O ₂ consumed minus O ₂ required by Nitrous Nitrogen.	Nitrous Nitrogen.	= Oxygen required.	Nitric Nitrogen.	= Useful Oxy-N ₂ O ₃ to	Total Oxidised Nitrogen.	Available Oxy- gen useful, O ₂ consumed.	Total N _{oxi- dised N. (Kjeldahl).}	Total Organic Nitrogen.	Total Inorganic Nitrogen.	Total Nitrogen of all kinds.
Effluent from cultivation tank, taken 3 and 5 p.m.	9.0	12.5	10.30	1.50	1.23	9.843	9.813	Nil	....	0.12	0.274	0.12	-	12.35	2.05	10.42	12.47
1. Effluent from first tray.	9.0	10.5	8.65	1.25	1.03	6.694	5.56	0.99	1.13	0.096	0.219	1.36	-	11.5	2.85	9.74	12.59
2 Effluent from second tray.....	8.5	9.0	7.42	1.00	0.82	5.773	4.74	0.90	1.03	0.48	1.09	1.38	-	11.10	3.68	8.80	12.48
3. Effluent from third tray.	8.5	5.0	4.12	0.60	0.49	4.493	3.60	0.78	0.59	1.87	4.27	2.65	-	6.00	2.48	6.77	9.25
4. Effluent from fourth tray.....	8.0	4.0	3.3	0.35	0.29	1.728	0.98	0.66	0.75	2.76	6.30	3.42	+	5.15	1.85	6.72	8.57
5. Effluent from fifth tray.	7.75	1.5	1.24	0.15	0.12	1.28	0.73	0.48	0.55	4.68	10.70	5.16	+	1.75	0.51	6.40	6.91
6. Effluent from sixth tray.	8.0	1.75	1.44	0.35	0.29	1.497	0.92	0.51	0.58	4.416	10.10	4.926	+	2.25	0.81	6.37	7.18
7. Effluent from seventh tray.....	7.5	0.35	0.29	0.30	0.25	0.755	0.755	Nil	.....	6.6	15.08	6.6	+	0.85	0.56	6.89	7.45
8. Effluent from eighth tray	7.5	0.20	0.165	0.65	0.53	0.397	0.397	Nil	.....	7.32	16.73	7.32	+	1.03	0.865	7.48	8.35
9. Effluent from ninth tray.	7.5	0.25	0.206	0.69	0.49	0.589	0.589	Slight trace.	.....	9.0	20.0	9.0	+	0.60	0.394	9.21	9.60

Colonies of Aerobic Nitrifying Organisms.

found that 2 to 3 parts of organic carbon in 100,000 parts of sewage are daily oxidized in the Exeter septic tank and removed in solution as carbonic acid as well as being given off into the air of the tank. Again Mr. Rideal points out, in the septic filters installed by Mr. Dibdin, where the sewage is pumped directly on to coarse burnt ballast of four feet in depth and allowed to stand two hours, to be thereafter drawn rapidly and completely off, its place in the pores of the filter being immediately filled with air to complete the disintegrating process by aerobic action, that the primary stage of *resting fluid* of sewage is an essentially anaerobic or septic stage. It will be apparent that there is equally the condition in the process of ordinary sand filtration of water. We may state then in general terms that any form of rough filtration removes a notable amount of suspended sewage matters amounting, according to Rideal, to about one-third of the organic nitrogen and one-half the carbonaceous matter of the sewage. The Massachusetts experiments as also those of Mr. Scott-Moncrieff point out that such rough filtration even at a very rapid rate as over 1,000,000 gallons per acre in practice removes a small amount of the soluble organic matters. The extended Massachusetts experiments further point out that such rapid filtration effectually removes germicides such as the soluble salts of arsenic formed by adding lime to sulphite of arsenic utilized in certain tanning processes, by the formation of a double insoluble salt of iron and arsenic, thereafter allowing the purification of the sewage to go on naturally by the processes of fermentation through carbon oxidization and nitrogen oxidization.

Summing up then the processes which the sewage of any town would be subjected to, according to what is now known of its treatment, whether mechanical, biological, or chemical, we would have

1. An initial aeration as in water and in the sewers, causing the production of a certain small amount of nitrogen, as free ammonia, to be present.

2. For the treatment especially of sewage including industrial wastes, and inorganic refuse as clay and sand, a rapid filtration through a bed of coke or coal, moderately fine over coarse, the upper layer of which can be readily removed and burned, the filter working at the rate of 1,000,000 gallons per acre daily, for a considerable time without clogging, or if the sand and clay have been in large part removed by previous sedimentation, at the rate, according to the late Col. Waring's experiments at Newport of 3,000,000 gallons daily per acre. The process in both cases removes from forty to fifty-four per cent. of albumenoid ammonia in the sewage.

3. The passing of the sewage upward through a second coarse coke filter, which may be termed the septic tank, or the alternative method of allowing the sewage to rest on a coke filter for several hours before draining it off.

4. The final passage of the sewage over a sand filter, a coke bed or to a sewage farm, where by aerobic fermentation the final reduction of organic nitrogen, as soluble free and albumenoid ammonia will take place by nitrosification and final nitrification

*We have seen in the table given in connection with Mr. Scott-Moncrieff's septic tank experiments the amounts of organic nitrogen in the effluent from the septic tank, and the nitrites and the nitrates after filtration through the successive coke filter trays; but the following analysis is of sewage taken January 3rd, 1898, from the Exeter works:

Analyses of Raw Sewage and Tank Effluent.

	Total solids.	Parts per 100,000.			Nitres.	Chlorine.
		Free ammonia.	Albumenoid ammonia.	Nitrites.	Nitrogen as nitrates and nitrites.	
Sewage, 4.45 p.m.	63.0	1.60	0.48	Nil	Nil	5.6
Septic tank effluent, 4.40 p.m.	65.6	4.00	0.25	Trace	0.13	6.3
Filtrate, filters 1 and three, three hours after discharge.	65.2	0.185	0.09	Nil	2.00	5.6
Filtrate, filter 4, five minutes after discharge.	62.5	0.20	0.09	Nil	2.00	5.5

* See Table, page xxxiii.

Having thus in the several paragraphs dealt with the principles involved in sewage purification the question will always arise with our municipalities and their officers as to the practical methods by which such principles can be carried out. If we were to sum them after our own observation and study it would seem that the following conclusions are justified in practice :

1st. Reduce the town sewage to be treated to a minimum (a) By the metering of the household supply of public water ; (b) By the introduction of the separate system of sewers ; (c) By the laying of open tiles in the same trench but at a little lower level than the sewer for dealing with ground water.

2nd. Lay all pipes on best gradients possible and thereby conduct sewage to its outfall as rapidly as possible.

3rd. In all cases where street wash, as in combined systems, is allowed to reach the sewers, have street catch basins, also have conical bottomed tanks at end of outfall sewer to catch the sand and other mineral or heavy deposits.

3rd. Have sewers laid with a view to discharging the sewage, with the least possible amount of pumping.

4th. In all cases conduct sewage into a tank at outfall capable of holding the greater part of a day's supply of sewage, this tank being in fact a septic tank of coarse coke, arranged preferably as a pair, the sewage discharging either on to the coke or from below upward. By the alternate tank and surface discharge the removal of the surface layer of coke is readily accomplished.

5th. The passage of the effluent from the septic tank preferably, if possible, to a sewage farm, where the utilization of the nitrogen compounds would produce the highest economic results without any possibility of a nuisance. This latter method is exactly that adopted ten years ago by Col. Waring in the disposal of the 75,000 gallons of sewage of the London Asylum with its 1,200 inmates. It is simply the collection of the sewage from all the buildings into a covered brick tank, whence the sewage is pumped daily a quarter of a mile and there distributed by the flat bed system in ditches to a porous sandy soil, and from which the water is rapidly utilized in watering the vegetables in the intervening flat beds. The value of these crops in the area of a four acre farm is estimated at least \$200 per acre.

6th. When owing to the price of land or its impermeable character this method is not wholly available, the final nitrification of the sewage from the septic tank will best be completed by a series of coke or sand filters through which the sewage will be allowed to pass slowly and intermittently, the tanks being used in succession.

We have very briefly summarized what seem to be the main biological facts involved in the complex problem in the dissociation of the organic compounds contained in sewage, and the natural processes by which such materials are reduced to simple compounds in what has been called by Professor G. Sims Woodhead, the mineralization of organic matter. He thus expresses himself :—

“ It would appear in fact as though there were developed special organisms for the setting up of special fermentations, and also after the breaking down has been carried a certain length by one organism, the aid of another is invoked to complete the process more thoroughly and more expeditiously. We have in this, as in the case of the process of digestion, an exemplification of the fact that nature economizes her resources as much as possible : she does not call on the animal cells of the alimentary tract to do the work that can be equally well done by micro-organisms, nor does she demand the exercise of more than one or two functions from each of the protoplasmic specks that we call bacteria. To each one is assigned its special work, and though it is possible that many of them started with certain powers in common, it seems that through the exercise of some of those common powers under special conditions they have become differentiated functionally, that, as amongst organisms more highly developed, each is able to carry on its own work best at those special stages of the putrefactive process at which it is found. It might at first sight appear that all this can have but little bearing on all practical work in which we are engaged, or in which we take an interest, but on more careful consideration it will be found that these putrefactive organisms really keep up the circulation of matter, utilizing the excretions of living beings and the carcasses of dead animals and plants, after

breaking them down into their simplest constituents, to supply those elements that are necessary for the nutrition of plants, allowing them to present themselves in their most assimilable forms, and in the proportion most suitable for the nutrition of the growing, highly organized vegetable protoplasm. Bacteria in fact serve to transform inert organic matter into organic substances. This transformation or 'mineralization' in most cases commences when protoplasm has lost its vitality, and most micro-organisms are capable of attacking this dead protoplasm only; though, as we shall find later a certain number of bacteria have acquired the faculty of being able to attack even living protoplasm. The process of decomposition may be divided into two kinds: first, those going on as the activity of organisms that are capable of taking up their oxygen from the air, and, second, those the result of the activity of organisms that so break up and re-arrange the organic molecules containing oxygen, that not only do they, the bacteria, take up oxygen themselves, but they allow of its being handed on to the product, to which in their processes of metabolism they give rise. It is probable that here we have to do, not only with nascent oxygen, but that we have certain products set free during the process of decomposition which seizes upon oxygen with very great avidity. This decomposition or re-arrangement is spoken of as a process of nitrification or a conversion of the nitrogenous elements into ammonia, nitrous and nitric acids, carbonic acid and water, or speaking more generally, it may be said to be a process of mineralization of the organic forms of nitrogen, phosphorus, carbon and hydrogen, during which they become finally oxydised or mineralized to nitric acid (HNO_3), phosphoric acid (H_3PO_4), carbonic acid (CO_2), and water (H_2O). In nature this process goes on in the superficial layers of the earth or in the presence of the atmosphere. That it takes place much more readily near the surface of the ground and in porous earth can easily be understood, if what takes place in the oxidation that goes on in spongy platinum is borne in mind."

So much appears in this problem viewed wholly from the sanitary standpoint; but it cannot be supposed that any natural processes involving the mineralization or reduction to a condition available for plant food of the enormous amounts of organic wastes from human populations can be accomplished without involving other scientific and sociological principles. This is illustrated by the fact that, dealing only with a single country, the population of England imports annually about 120,000,000 bushels of wheat, or to take the problem of Sir William Crooks in his presidential address before the British Association for the Advancement of Science, in 1898, he has stated that the "bread eaters of the world have increased from 371,000,000 in 1871, to 516,500,000 in 1898," and has calculated that in order to give each an average daily amount of food 2,324,000,000 bushels annually are required. This remarkable advance in the amount of food supply required is illustrated from the further standpoint, that the population in 1891 of 68 towns in Germany, England and France, together included 21,050,000, while in 1840 there were but 4,800,000 persons living under similar conditions. A recent writer regarding trade and commerce, has made the further remark that the industrial population to which Manchester is the importing and distributing centre alone amounts to some 10,000,000. It is hardly necessary with such facts before us, to point out that since the equivalent of every bushel of wheat is represented in the sewage wastes of our cities and towns by a definite amount of organic nitrogen, the problem is a serious one as to how long the indiscriminate destruction and waste of this natural food for plants, and especially for the wheat crop, by allowing the sewage to be poured into the streams, can go on, before there will be a natural scarcity of that nitrogen upon which the success of the wheat crop most intimately depends. This matter has been dealt with recently by Sir William Thompson, Lord Kelvin, in which he has pointed out the startling fact that the United Kingdom sends annually to the sea nitrogen to the value of no less than £16,000,000 sterling.

Professor Crooks further points out that the sources of artificial fertilizers, such as nitrate of soda and guano, are rapidly becoming exhausted. And he states, further, that while the storing of nitrogen in the atmosphere is practically unlimited, it is, nevertheless, rendered fixed and assimilable only by cosmic processes of extreme slowness. "The nitrogen which with a light heart we liberate in a battleship broadside, has taken millions of minute organisms patiently working for centuries to win from the atmosphere." He then refers to the question of what other sources we have to look to in order to obtain the nitrogen without which the growth of the food of man becomes an impossibility; and then refers to experiments by which it is made apparent that electrical oxidation of the nitrogen of the air is likely sooner or later to become a commercial source of supply of artificial fertilizers for the growth and development of our food supplies.

These references to the discussion of such important problems by two of the greatest of the world's physicists is enough to cause us to carefully study the conditions prevailing in Canada in order that we may at any rate limit by prompt action the mistakes already made and which have become so serious in the older countries of Europe and Asia. We must fully realize that there is not only a unity of purpose in nature's processes, but also that all the forces of nature have an intimate relationship with one another, and that as all forms of animal and vegetable life are dependent upon inorganic life, so inorganic matters are again reproduced by the disorganizing, dissociating processes of plants and animals. We have already seen that the amounts of organic wastes from any given population, calculated as to their value from a fertilizing standpoint, can be accurately estimated, and that there is only the problem remaining of the invention of mechanical methods by which biological processes can be made available in a commercial manner by turning such wastes back again into plant foods. As already stated in the beginning of this chapter, the problem has scarcely been touched in Canada, but necessity therefor has hardly been realized, and the municipal methods have been hitherto much too crude to enable any municipality to adopt comprehensive measures for successfully carrying out from the commercial standpoint nature's plans for the turning of the organic wastes of town sewage into artificial fertilizers. What can be done has been well illustrated in certain places in England, and still better at Paris and at Berlin. We have too in Ontario one illustration of how sewage may become an actual source of agricultural wealth, viz., that of the sewage farm at the London Asylum; but as yet it is but a beginning.

The city populations have not yet been great enough, and the diluting powers of our lakes and rivers have been too large to heretofore force problems, such as the conservation of the wealth contained in the nitrogen of sewage, upon the attention of our people. The city now only thinks of getting rid of those wastes at a minimum of inconvenience and cost to itself, regardless largely of whether it does a material or vital injury to its neighbor. The agriculturist has too inadequate an idea of the loss he yearly sustains through the removal of nitrogen products from his farm, as straw and hay, to seriously question whether the sewage of towns has any settled relation to his commercial success. Under such circumstances, it is quite clear that the notable evolution of scientific thought is necessary amongst our people before they can realize that the producer and consumer of foods have commercial relations quite as intimate as are either their political or social relations, and we have yet to learn and put in practice the truth contained in that very ancient story of Roman history in which Menenius Agrippa convinced the common people at the Sacred Mount how intimate was the relationship between the ruling class or the patricians, and the common people or plebs, by the memorable fable of "The Belly and the Members."

As however, the nineteenth century has seen made year after year discoveries each seeming to surpass the other, so we have every reason to believe that the scientific evolution of the twentieth century will be adequate for the social needs of generations to be. With the powers given under public health laws in Ontario we only require the steady advance of public opinion through education, and an increasing realization of the belief that each unit of society influences definitely the well being of all others to see a balance more than maintained of the constructive over the disintegrating forces which affect society at large. Such a belief is that given expression to in the closing words of the late Sir John Simon in an address on "Experiment as a Basis of Preventive Medicine." He said: To the science of nature, indeed, is allotted that one incomparable human day which knows no sunset. In the fierce light of its everlasting daybreak individual workers will pass away, generations will change; but the studies of nature and above all, the gathering of such knowledge as can lessen man's physical difficulties and sufferings will surely grow from age to age, and, as in Proserpina's sacred tree, one golden fruit will follow another:—*Semili frondescet virga metallo!* Such were the enthusiastic words full of faith not only in the future of Preventive Medicine, but in the happiness which would accrue therefrom to men, spoken (in 1881) by the great leader of Preventive Medicine. And yet, reviewing the situation at the end of the century, we are forced in the words of Dante to say:—

“There is no light that comes from the Serene
That never is o’ercast.”

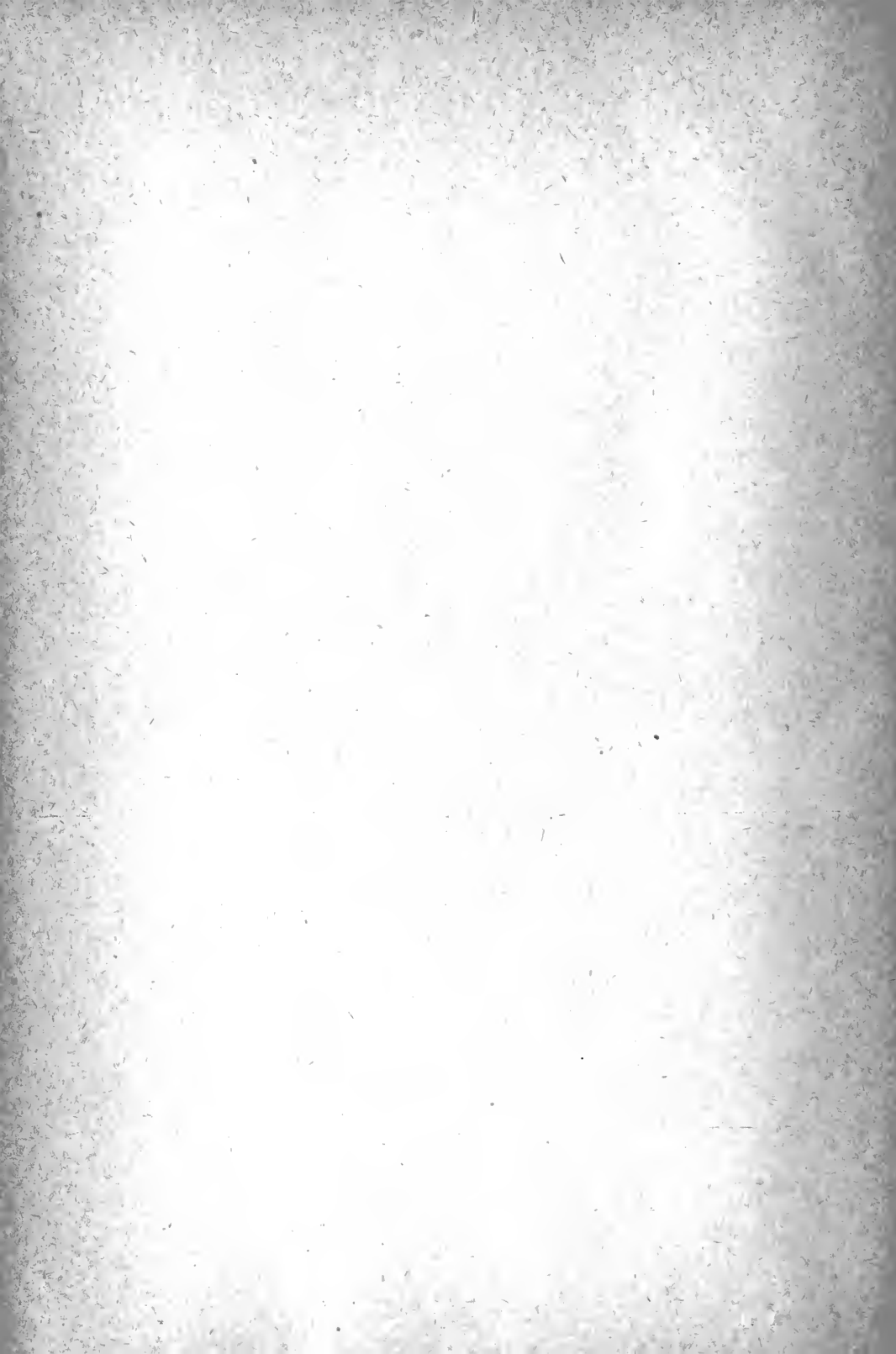
Self interest, ignorance and prejudice have delayed, and will still prolong the struggle of man upward to the light; but in the words of Dr. Crozier :—“The scientific spirit is already a potent one, and is daily exercising more and more influence over the most intelligent and cultured minds.” Philosophers of all ages and in many lands have seemed to see in the near future the realization of their dream when as with Buddha evil would be banished and the higher nature would be supreme at every point where man would “stand like a pillar of the city gates unmoved, like the broad expanse of earth unveiled, or like the pellucid lake unruffled.” But the dream is far yet from being fulfilled; and nowhere is it more frequently or more painfully forced upon us than while endeavoring to obtain some comprehensive idea of the manifold influences affecting man unfavorably in regard to his physical environment, and through this his whole intellectual and moral nature. While it may be quite true that man knows better than he does, yet the fact stands, that he would require “a complete and perfect knowledge of physical, mental, moral and social laws,” were he to be able to banish all the ills which flesh is heir to, and which we have already amply illustrated is far from his present position. And yet it is sufficient to urge us onward in the work that lies before us to believe and remember the immortal words of Tennyson :—

“A soul shall draw from out the vast
And strike his being into bounds
And moved thro’ life of lower phase
Result in man, be born and think,
And act and love, a closer link
Betwixt us and the crowning race.
Of those that eye to eye, shall look
On knowledge; under whose command
Is earth and earth’s, and in her hand
Is nature like an open book.”

Respectfully submitted,

P. H. BRYCE, M.A., M.D.,
Secretary.

PART II.



CHAIRMAN'S ANNUAL ADDRESS.

By J. D. Macdonald, M.D., Hamilton.

TORONTO, January 30th, 1899.

GENTLEMEN,—It is, I think, my duty, and if it be not my duty it is my impulse, to give expression to my satisfaction at our meeting here again at this time to begin the work of another year and that all our associates are in the enjoyment of good health and ready to perform the functions looked for from them as members of the "Provincial Board of Health." It is not unusual to speak of transactions such as we are to engage in as "labours." I do not use that term in connection with them. They are of so much interest to us all, that I am persuaded it would not be truly descriptive if they were thus distinguished.

It was at one time thought, on the part of some, that this meeting would not consist of the same members constituting it hitherto or at least for some years past. It is I think proper for us to say that we think it to be well that no change, such as may have been expected, has taken place. The duties of the Board are such as to make it desirable that one of its characteristics should be its continuity, such changes as take place in its membership not involving all those who composed it at the same time.

In opening our meeting for the year, it is a pleasure for us to say that the health of the country has been good during the year which has passed. No epidemic has appeared, nor have infectious diseases obtained a footing in the land. Some of the latter kind have appeared, as appear they will from time to time, but whenever such have caused alarm so as to cause that they be reported here they have been promptly suppressed by measures directed by the active secretary of the Board. Diseases of that nature are seen tabulated in the monthly reports, but the cases have not been so numerous as to enable us to say that they have had any prevalence. Hitherto however an exception should be made with respect to our old enemy tuberculosis. It is always present, a persistent life destroyer, and during the year past has been true to its history. It has cost the country more lives than all the other diseases reported when added together.

Tuberculosis hitherto has been less influenced in its prevalence by endeavors at prevention than all others of the infectious maladies. To the mind of the medical profession its continued virulence is due to the chronicity of the disease and hence to the difficulty in the use of such means towards checking its diffusion as are serviceable in other infectious maladies whose course is shorter. It is not altogether too strong language if we say that the profession is in a vexed state because of the difficulty of bringing about some degree of suppression of this malady, and that not because the difficulty is insuperable, but because so far society has not come to look on the necessary means with favour. The means are regarded as too severe and as being to "the many" altogether unpracticable.

Notice is before us, for discussion to-day, on the part of our confrere Dr. Cassidy, of a paper whose purport it is that the Board declares phthisis to be a notifiable disease. Placarding a house is spoken of by the laity with impatience. Most of us are aware that this is a thing to be desired. We have discussed the matter with the profession and with our friends outside of it, and the result has always hitherto been that the project has been dismissed as being one which would not be tolerated. To keep a house quarantined and denied social intercourse for a year or two as it might be, would seem a severe infliction, and it is more than doubtful if either the inmates or their friends and neighbours would give attention to the warning left by the health officer. Very many consumptives continue breadwinners for years. For such the inhibition placed upon the door would be a hardship, and would be regarded as an unreasonable interference with the duty of earning the daily bread of the family. Some of us who have discussed this expedient for the prevention of disease with our friends and acquaintances have had the matter presented to us in the light just adverted to and that with some touch of indignation as if the measure was high handed. Upon the whole it would seem that much time will be needed to reconcile the majority to such a decision on the part of the Board of Health.

The other mode of separation of the tubercular from the healthy, to wit, that by means of consumption hospitals or homes, meets with less objection. It seems acceptable, especially to those whose worldly circumstances are comfortable and who expect to pay for their residence and treatment in those institutions. No one says anything unfavorable of them, and as is well known they are very generally taken advantage of. Those accepting the benefit of them are the comfortable classes, and where pecuniary conditions permit they are most beneficial institutions. If it were possible to get the labouring classes accommodated in such the problem of the prevention of phthisis would be nearer its solution. In the meantime, however, the larger number of those affected with phthisis are necessarily excluded from them, and will continue to be, unless the providing of the hospitals be undertaken at the public expense, whether on the part of the Governments of the Provinces, or of the municipalities.

It seems to be believed by many whose opinions are of value, that a principal agent in initiating tuberculosis in the human subject, is the bovine family. Perhaps if that family had been able to entertain and express an opinion, we might be given to understand that the course of things was, probably, at least often, the reverse. But there can be little doubt the treatment of cattle, the habits of life imposed upon them, is very favourable to the lodgement and increase of the bacillus of tuberculosis in and among their tissues. It is very likely that many a family, both in town and country, when phthisis breaks in upon them need not have to look farther than their cattle stables when they ask for the source of the plague which has cost them so dear. The evil here adverted to, it has to be admitted, is not overlooked by health authorities, but there can be no harm in impressing upon the owners of cattle, both for the sake of their own health and of that of others, that they be particular about the cleanliness and free aeration of their premises, and that health authorities throughout the country be frequently exhorted to increase their watchfulness over the district committed to their supervision. For the rest, much may be trusted to the gradual growth in the public mind of the necessity of consenting to measures for the restriction of consumption which may seem to them now to be excessive. The general acquaintance with the nature of the disease has increased much within the memory of some of us, and no doubt will grow more towards perfection.

AN ARGUMENT FOR THE APPOINTMENT OF COUNTY HEALTH OFFICERS.

Quarterly Report of the Secretary.

TORONTO, April 19th, 1898.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—Inasmuch as the Act establishing Local Boards of Health in Ontario has been in operation for fourteen years, it has appeared to your Secretary proper to present for your consideration the results of his experience in the operation of the Act in effecting the objects for which it was established, as well as some statistics gathered from a circular sent out to Medical Health Officers, dated February 15th, 1898.

It will be remembered that up to 1884 there were only a few health committees of municipal councils in existence, and that before that time whatever public health work was done was rather of an accidental character, as when some outbreak of small-pox demanded special attention. Since 1884 public health work has been by law relegated to local boards of health, formed of ratepayers, who might or might not be members of council. Up to 1895 many of such boards were composed largely of the members of the council, but I find in the answers to the circular that owing to the amendment to the Act in that year making the term of office three years for the appointed members, boards are

now generally composed of the ex-officio members (the reeve and clerk of the Council) and ratepayers who are non-members. This is reported to be the case in 169 of the 285 replies received.

There is evidence to show that this result has served to make the Local Boards more independent in their actions than formerly, but that their operations are still in most instances of a very limited character is shown by the replies stating that in very few instances, comparatively, is any grant placed in the estimates of the Municipal council at the beginning of the year for public health work.

Thus from 285 replies it is stated that 16 boards in cities, towns and villages have grants to the amount of \$51,374.00, more than half this amount being for the city of Toronto; and that 13 boards in townships have an amount set apart equal to \$560.00. Speaking generally the answers state that the boards send in their accounts to the Council, which are not always passed, at least without serious discussion.

That the amount that is expended, except in the case of the larger cities, is insignificant may be gathered from the tables following. With regard to these amounts for public health work it is, however, of further interest to note the replies made to the question as to whether members of the Local Boards receive any allowance for meetings of the board. From 285 replies it is found that in accordance with the practice as regards the Council no payment is made to members of city and town boards; but as regards township boards it will be seen that 106 out of 243 boards receive a per diem allowance for attending meetings of from \$1.50 to \$3.00, with, in some instances, mileage. These amounts are not included in the amount stated in the instances given as being set apart for the work of the year.

In connection with this allowance to members of the board the answers to the question as to what amounts are paid and how to the medical health officers of the boards may be noted. From the 479 medical health officers appointed for 1898, 285 answers were received. These answers are summarized in appended tables.

Under the Act, however, provision is made for the appointment of sanitary inspectors. According to the returns of boards organized in 1898, 150 sanitary inspectors were appointed. Replies regarding these appointments and salaries were made from 285 boards. The answers summarized give the results seen in the tables.

Such then, so far as statistics are available, are the results of fifteen years' evolution of public health work in Ontario. It must be remembered that there are some 745 organized municipalities including those in the Territorial Districts, most of these latter, however, having populations averaging probably 500.

For 1898, 568 boards have been reported as having been appointed by the Councils. Of these reported, 479 have medical health officers appointed, and 150 have sanitary inspectors. Of the replies made to the circular 204 or 71 per cent. state that the medical health officers are appointed annually, and 28 or 10 per cent. during the pleasure of the Council. Of the same number reporting, 70 per cent. of the sanitary inspectors are appointed annually, and 10 per cent. as per reports during pleasure or permanently. Of the boards appointed, 40 per cent. in townships pay a per diem allowance to members of boards, 60 per cent. pay nothing.

Of the medical health officers, 30 per cent. receive an annual salary, 00 per cent. are paid only for such specific work as they are asked by the Council or Local Board to perform, and 2.0 per cent. receive nothing, except as remarked by some, "glory."

While we must remember that the Public Health Act has been in operation but 15 years, while it cannot be forgotten that public health work everywhere has practically a history of but half a century, and that in Ontario a very notable number of municipalities have been organized within this period, yet it must be confessed that the results so far as the organization of an effective and systematized public health system in the Province is concerned are somewhat disappointing, though not discouraging. They are not discouraging for the following reasons:—

1st. That the work was 15 years ago, one whose needs and aims were unknown practically to the great body of the people. The mass of the people thought disease had to be, and that they should endure it with resignation.

2nd. That to-day a very general public opinion has been developed, to the effect that a notable number of our most fatal diseases are communicable by contagion from person to person; that others depend directly on insanitary conditions as polluted water, and wrong sewage disposal and that therefore both are preventable.

3rd. That private and personal interests in matters of health must be made secondary to the greater public good.

4th. That daily from every direction, we have evidences that the people generally show a remarkable willingness to obey the laws for promoting the public health, often to their own personal or family inconvenience.

5th. That constantly from private persons and from officers and members of health boards, appeals are made to your Board, and local authorities for the enforcement of law.

6th. That the Legislature and Municipal councils have made abundant provisions by specific enactments for dealing with almost every kind of insanitary condition.

Wherein, therefore, would seem to be found the reasons for results, which it must be confessed are disappointing?

I do not propose to enter upon a discussion of the merits and demerits of our system of municipal government, but shall refer briefly to such points as bear upon the subject in hand. Much has been said for and against the powers given to school authorities to demand such amounts of municipal moneys as they deem requisite for maintaining and promoting educational progress. Since trustees are elected by the people, they would seem to be as directly responsible as members of the Councils for the expenditure of public funds. As Local Boards of Health are appointed and not elected, it may fairly be argued that they should not at will have the power to make expenditures for which they are not directly answerable to the people. Inasmuch, however, as they are required to perform certain duties positively laid upon them by the Public Health Act, it is apparent that where the Councils fail to make grants, the work must either be left undone, or the board must have a right to call upon the treasurer to honour their bills. Such indeed is actually the law; and it might be assumed that Local boards would take advantage of their powers. As a matter of fact however, as we have seen from the returns, Local boards have been so tied up in their membership with members of the Council, that they have but seldom realized and asserted their rights and powers.

This same neglect to exercise legal rights and duties has operated yet more in the case of medical officers. Though the Public Health Act distinctly empowers and requires such officers to perform many of the same duties, which are required of Local boards, whether or not the latter order the same to be done, yet by an anomaly of the Act, the medical health officer is an appointee of the Municipal council, and as we have seen is practically always appointed annually. It is plain therefore and has proved almost invariably true in practice, that any medical health officer who has actually attempted to carry out the duties he is called upon to perform by virtue of his appointment has antagonized the Local board, which, in practice, seems to think that it has the sole right to determine what a medical officer ought or ought not to do. Should such an officer, however, attempt to do thorough work, and be supported by the Local board, he will soon find that since he is the appointee of the Council, they will see that he shall not a second year incur expense in carrying out the plain intention of the Act. They have, however, insured that such an officer will not prove too active by limiting his salary, if indeed he receive any at all, to such an insignificant sum, that no medical officer for the amount paid is likely to make himself antagonistic to the Council and make himself unpopular with the people amongst whom he practices. Just imagine such an officer seriously attempting for the \$5.00, \$10.00, or \$25.00, the average annual salaries in all but the towns and cities, to do public health work, oftentimes thereby creating misunderstandings

with his fellow practioners, and offending those (who may violate the law) and yet may be or are his patients.

The experience of fifteen years has abundantly illustrated the fact, that while the Local boards are in a position to do good work, the method of appointment, the tenure of office, and the salary or fees paid, make the position of the medical health officer an anomaly and absurdity. We except, of course, the large cities, where a certain importance and dignity are attached to the office, because of the extent and urgency of the work, and because the salary is at times enough to cause an officer to give himself loyally to the work.

The position of a medical health officer of a township is especially an anomaly, for there we see five members of a board of health holding from six to twelve meetings annually, at a cost of usually \$10.00 a meeting, often with mileage, or say \$100.00 a year, and who, when in their wisdom they think it convenient, call in the medical health officer, generally to do some disagreeable work they do not wish to touch themselves, and then offer him a fee, perhaps not greater than each of themselves receives for sitting upon the case.

There are two other good reasons why the present system cannot progress. First, because sanitary work is largely scientific work, and members of Local Boards of Health do not understand how to effectively deal with the troublesome technical matters that are frequently arising, and second, because the extent of the work in a single small municipality is too limited to enable it to pay a medical health officer for devoting such time to the work as will make him conversant with all the phases of public health work, or be willing to antagonize persons whose selfish interests he may affect.

To illustrate this point, I may mention the facts again and again brought to my attention by those interested in cheese factories, viz. : that Local Health Boards or their officers have failed either to suggest or enforce measures for remedying the nuisances so dangerous to the manufactured products, caused by the disposal of the refuse from these factories. Your secretary has been appealed to to have special Provincial powers given to the inspectors of cheese factories. Similar appeals have been made to obtain Provincial powers for inspectors *vs* tuberculosis in cattle. Appeals have again and again been made to have Provincial inspectors appointed by the Government, though, as we know, there are now five Provincial inspectors dealing with the inspection of factories.

Obviously then, the object of the Act in the appointment of Local Boards of Health for the ordinary small municipal areas, but especially for the development of scientific sanitation through medical health officers, has failed of its accomplishment. No physician conscientiously desirous of doing good work will, or can be expected to, place himself in a position so anomalous and undignified as the instances quoted show it to be; and hence we have now to enquire whether after 15 years, during which the science of Preventive medicine has grown so marvellously in exactness and the certainty of the methods to be adopted, there is not another means by which, with the expenditure of even less public funds, results can be obtained commensurate with the outlay and in keeping with scientific advancement in other fields of public work. Manifestly there are three conditions necessary to accomplish the desired end.

First.—Enlarge the area of the sanitary district to such an extent that it can afford to pay adequately for the services of a medical health officer, who shall devote all his time to the work.

Second.—Ensure the training of men in the various branches of applied science necessary to fit them to perform well the duties of a medical officer of health.

Third.—Permanency of tenure of office.

Dealing briefly with the first, it may be said that the electoral divisions, or the districts for which county inspectors of schools are appointed, would be amply large enough to give to a single medical health officer the very fullest occupation.

As regards the second point, men having a science degree in arts and a degree in medicine, would readily be able to fit themselves for the work, and prove their fitness by

examinations specially held on the class of work to be done. There will be no serious difficulty about getting trained men if the opportunities for permanent appointments exist.

As to the third point of permanency of tenure, it is unnecessary to do more than say that, like all scientific work, its very progress demands that medical health officers be kept apart from those questions which seem to-day to almost inevitably drag ordinary citizens within their influence. The man of science everywhere, as in our colleges, cannot afford for the sake of his work to meddle with political questions, and by the same right he may demand that he shall not be made their football, and that in the work of a health officer, where of necessity he must oppose himself at times to selfish interests, the public must insure for him that he be independent in action.

These matters, gentlemen, have seemed to me so important at the present juncture that I would in conclusion respectfully suggest that your Board will use all its influence to have the needs of its work in the matter so strongly set forth that a bill for amending the Public Health Act in this direction may be prepared for submission to the next meeting of the Legislature.

I have the honor to be,

Your obedient servant,

P. H. BRYCE,

Secretary.

The report was unanimously adopted.

Replies to Questions in circular dated February 15th, 1898, and sent to Medical Health Officers.

Question 2.—Is the appointment of Medical Health Officers and Sanitary Inspector made annually? If not state definitely on what terms the Council made the appointment.

(T.=Towns or urban; P.=Township or rural.)

County.		Annually.	Pleasure.	Permanent.	County.		Annually.	Pleasure.	Permanent
					<i>Brought forward</i>		93	13	2
Algoma	T..	1			Middlesex	T..	4	2	
	P..	3				P..	6		
Brant	T..	1	1		Muskoka	T..	2	1	
	P..	2				P..	6		
Bruce ...	T..	4	1		North'd and D....	T..	3		
	P..	5				P..	5	1	
Carleton	T..	1			Norfolk	T..	2	1	
	P..	3				P..	1		
Dufferin	T..	0			Ontario	T..	4		
	P..	2				P..	3	1	
Elgin	T..	4			Oxford	T..	3		
	P..	3				P..	3	1	
Essex	T..	2	1		Peel	T..	1		
	P..	4	1			P..		1	
Frontenac	T..	0	1		Peterboro'	T..	1	1	
	P..	0		1		P..	2	1	
Grey	T..	2			Perth	T..	1	1	
	P..	5				P..	4		
Haldimand	T..	1			Prescott and R....	T..			
	P..	2				P..	2		
Hastings	T..	2			Prince Edward	T..	2		
	P..	4	1			P..	3	1	
Halton	T..	4			Renfrew	T..	2		
	P..	2				P..	3		
Huron	T..	4	1		Simcoe	T..	3		
	P..	3				P..	9		
Haliburton	T..				Stormont, D. and G.	T..	2		
	P..	1	1			P..	3		
Kent	T..	2			Victoria	T..			
	P..	7				P..	4		
Lambton	T..	2	1		Waterloo	T..	4		
	P..	4				P..	2		
Lanark	T..		1		Wentworth	T..	1		1
	P..		1	1		P..	3		1
Leeds and Grenville.	T..	2	1		Wellington	T..	3		1
	P..	4	1			P..	2		
Lennox and Ad'ton..	T..	1			Welland	T..	2		
	P..	3				P..	5	1	
Lincoln	T..	3			York	T..	1	2	
	P..					P..	2	2	
<i>Carried forward</i>		93	13	2	<i>Total</i>		204	28	5

Question 3.—Are you paid an annual salary? If so, is this supposed to cover all work which the Act requires you to do, as in an epidemic?

County.	Annual sal- ary.	Fees or work done.	Nothing.	County.	Annual sal- a.y.	Fees or work done.	Nothing.
				<i>Brought forward....</i>	33	70	3
Algoma	T. 1			Middlesex	T. 3	3	
	P. 2	2	1		P. 2	6	
Brant	T. 2	2		Muskoka	T. 1	2	
	P. 3	2			P. 1	5	
Bruce	T. 3	5		North'd and D.....	T. 1	2	
	P. 1	2			P. 1	7	
Carleton.....	T. 1	1	1	Norfolk	T. 1	2	
	P. 2	2			P. 1		1
Dufferin	T. 2	2		Ontario	T. 4		
	P. 2	3			P. 2	2	
Elgin	T. 2	3		Oxford	T. 2	1	
	P. 3	3			P. 1	4	
Essex	T. 2	2		Peel.....	T. 1		
	P. 3	2			P. 1		
Frontenac	T. 1	1	1	Peterboro'.....	T. 1	2	
	P. 1	1			P. 1	1	
Grey	T. 2	2		Perth	T. 1	1	
	P. 1				P. 1	6	
Haldimand	T. 1	3		Prescott and R.....	T. 1	1	
	P. 1	2			P. 1	2	
Hastings	T. 1	4		Prince Edward	T. 1	3	
	P. 3	1			P. 1	2	
Halton	T. 1	2		Renfrew.....	T. 1	3	
	P. 1	4			P. 1	2	
Huron....	T. 1	3		Simcoe	T. 3		
	P. 1	3			P. 5	3	
Haliburton	T. 2			Stormont, D. and G.....	T. 1	3	
	P. 1	1			P. 1	6	
Kent	T. 1	1		Victoria	T. 1		
	P. 6	1			P. 5		
Lambton	T. 1	3		Waterloo	T. 2	2	
	P. 5	3			P. 1	1	
Lanark	T. 1	1		Wentworth	T. 1	1	
	P. 3	3			P. 1	3	
Leeds and Grenville.....	T. 1	3		Wellington	T. 3	1	
	P. 1	3			P. 1	2	
Lennox and Ad'ton.....	T. 1	2	1	Welland	T. 2	2	
	P. 1	4			P. 2	1	
Lincoln	T. 1			York	T. 2	4	
	P. 1				P. 1		
<i>Carried forward</i>	33	70	3	<i>Total</i>	82	158	6

Question 5.—What is your annual salary? What amount did you or your predecessor receive in 1897 for both regular and special work?

(Note.—The total salaries in any county are added together in the columns.)

Towns.				Townships.			
County.	Salary.	No. of towns	No salary.	County.	Salary.	No. of towns	No salary.
	\$ c.				\$ c.		
Algoma ..	50 00	1	.....	Algoma ..	12 50	2	.....
Brant	450 00	2	.....	Brant	56 65	2	.....
Bruce	65 00	4	.....	Bruce	30 50	4	.....
Carleton ..	20 00	1	.....	Carleton ..			0
Dufferin ..			0	Dufferin ..	27 00	2	.....
Elgin	425 00	4	.....	Elgin	30 00	2	.....
Essex	516 00	3	.....	Essex	40 00	4	.....
Frontenac ..	400 00	1	.....	Frontenac ..			0
Grey	7 50	2	.....	Grey	53 00	4	.....
Haldimand ..	10 00	1	.....	Haldimand ..			0
Haliburton ..			0	Haliburton ..	7 00	1	.....
Lanark			0	Lanark	12 00	2	.....
Leeds and Grenville.	2 00		.....	Leeds and Grenville.	20 75	2	.....
Lennox and Ad'ton..			0	Lennox and Ad'ton..			0
Hastings			0	Hastings	36 75	3	.....
Halton	85 00	3	.....	Halton	20 00	1	.....
Huron	80 00	2	.....	Huron	34 50	3	.....
Lincoln			0	Lincoln	10 00	1	.....
Lambton	3 50	1	.....	Lambton	13 50	3	.....
Kent	2 10	2	.....	Kent	200 00	6	.....
Middlesex	10 50	5	.....	Middlesex	70 75	7	.....
Muskoka	25 00	1	.....	Muskoka	30 00	2	.....
North'd and D.	50 00	1	.....	North'd and D.	43 00	4	.....
Norfolk	25 00	1	.....	Norfolk			0
Ontario	4 00		.....	Ontario	72 25	3	.....
Oxford	55 60	2	.....	Oxford	68 00	4	.....
Perth	200 00		.....	Perth	32 00	3	.....
Prescott and R.			0	Prescott and R.	20 00	2	.....
Peterboro'	220 00	3	.....	Peterboro'	139 50	2	.....
Peel	25 00	1	.....	Peel	50 00	1	.....
Prince Edward			0	Prince Edward	23 00	2	.....
Renfrew	5 00		.....	Renfrew	17 00	2	.....
Simcoe	80 00	2	.....	Simcoe	105 50	8	.....
Stormont, D. and G.	25 00	1	.....	Stormont, D. and G.	201 00	5	.....
Victor a			0	Victoria	135 00	5	.....
Waterloo	75 00	2	.....	Waterloo	50 00	2	.....
Welland			0	Welland	78 75	6	.....
Wentworth	817 00	2	.....	Wentworth	29 00	2	.....
Wellington	125 00	3	.....	Wellington	14 40	2	.....
York	3,065 00	4	.....	York	105 00	4	.....
Total	6,923 20	55	10	Total	1,888 40	108	5

Question 6.—Is a regular annual grant made by the Council for the work of the Local Board of Health? If so, how much?

County.	Yes.	No.	Amount.	County.	Yes.	No.	Amount.
			\$ c.				\$ c.
Algoma	T.	2	.....	Brought forward .....	.....	.....	.....
Brant	P.	6	.....	Muskoka	T.	3	.....
Brant	T. 1	1	200 00	Northumberland	P.	6	.....
Bruce	P.	2	.....	and Durham	T. 1	2	200 00
Bruce	T. 1	3	50 00	Norfolk	P. 2	5	15 00
Carleton	P.	6	.....	Norfolk	T. 1	4	.....
Carleton	T. 1	2	100 00	Ontario	P. 1	.....	.....
Dufferin	P.	1	.....	Ontario	T. 1	2	85 00
Elgin	T. 1	2	.....	Oxford	P. 2	1	100 00
Essex	P. 1	4	1,900 00	Oxford	T. 1	3	50 00
Essex	T. 1	1	25 00	Peel	P. 1	.....	100 00
Frontenac	P.	2	600 00	Peterboro'	T.	2	.....
Grey	T.	2	.....	Perth	P. 1	1	25 00
Grey	P.	4	.....	Perth	T. 2	4	50 00
Haldimand	T.	1	.....	Prescott & Russell	P.	2	.....
Haldimand	P.	4	.....	Prince Edward	T.	1	.....
Lanark	T.	3	.....	Prince Edward	P. 1	11	18 00
Leeds & Grenville	P.	4	.....	Renfrew	T.	2	.....
Leeds & Grenville	T. 1	3	.....	Simcoe	P.	4	.....
Lennox and Ad-	P.	1	100 00	Simcoe	T. 1	9	25 00
dington	T. 1	2	10 00	Stormont, etc.	P.	3	.....
Lincoln	P. 1	.....	500 00	Stormont, etc.	T.	6	.....
Lincoln	T. 3	.....	.....	Victoria	P.	5	.....
Hastings	P.	2	.....	Waterloo	T.	4	.....
Hastings	T.	5	.....	Waterloo	P.	2	.....
Halton	P.	4	.....	Wentworth	T. 1	1	9,500 00
Halton	T. 1	2	30 00	Wentworth	P. ....	.....	.....
Huron	P. 1	2	12 00	Wellington	T. 2	3	325 00
Haliburton	T.	2	.....	Wellington	P. 1	3	50 00
Kent	P.	4	25 00	Welland	T.	2	.....
Kent	T. 2	.....	50 00	Welland	P.	6	.....
Lambton	P. 1	2	200 00	York	T. 1	3	35,569 00
Lambton	T. 1	3	20 00	York	P. 1	6	.....
Middlesex	P.	5	2,000 00	Total	41	222	51,934 00
Middlesex	T.	8	.....			
Carried forward .....	.....	.....	.....	

16 boards from cities and towns grant \$51,374 00
 13 boards from townships grant 560 00

Total..... \$51,934 00

Question 7.—Are the members of the Local Board of Health paid a per diem allowance for meetings?

County.	T. or P.	Paid.	Not paid.	Per diem.	County.	T. or P.	Paid.	Not paid.	Per diem.
				\$ c.					\$ c.
					Brought forward..		39	74	
Algoma	T.	.....	2	1 50	Middlesex	T..	1	4	{ \$2.00, 5 meet-
	P.	4	3	3 50		P..	8	.....	ing.
Brant	T.	.....	2	.....	Muskoka	T.	.....	4	.....
	P.	1	1	2 00		P.	2	2	.....
Bruce	T.	.....	.....	.....	Northumberland				.....
	P.	.....	10	2 00	and Durham..	T..	.....	3	.....
Carleton	T.	.....	1	.....		P..	6	1	{ \$3.00 and \$2.00
	P.	1	1	2 00	Norfolk	T.	1	2	mileage.
Dufferin	T.	.....	.....	50		P.	.....	.....	.....
Elgin	T.	.....	1	.....	Ontario	T.	.....	4	.....
	P.	4	3	{ \$2.00 and 10c.		P.	4	.....	.....
Essex	T.	.....	1	mileage.	Oxford	T.	.....	3	.....
	P.	4	1	2 00		P.	3	1	1 50
Frontenac	T.	.....	1	.....	Peel	T.	.....	2	.....
	P.	.....	3	1 50 to 2 00		P.	1	.....	.....
Haldimand	T.	.....	1	.....	Peterboro	T.	.....	1	.....
	P.	2	3	.....		P.	3	1	1 00
Lanark	T.	.....	3	.....	Perth	T.	.....	2	.....
	P.	3	1	2 00		P.	4	1	.....
Leeds and Gren-				.....	Prescott	T.	.....	.....	2 00 and 2 50
ville	T.	.....	3	.....		P.	2	.....	.....
	P.	2	2	.....	Prince Edward..	T.	.....	1	.....
Lennox and Ad-				{ Chairman, \$20.		P.	4	4	.....
dington	T.	1	1	Secretary, \$25.	Simcoe	T.	.....	4	1 50
	P.	1	1	M.H.O., none.		P..	4	3	2 50
Lincoln	T.	.....	3	.....	Stormont, Dun-				.....
	P.	1	.....	.....	das and Glen-	T.	.....	3	.....
Hastings	T.	.....	1	.....	garry	P..	4	2	.....
	P.	2	4	.....	Waterloo	T.	.....	2	.....
Halton	T.	.....	4	2 00		P..	6	5	\$2.00 mileage.
	P.	2	.....	.....	Wentworth	T.	{ Free	1	.....
Huron	T.	.....	4	.....		P..	3	1	.....
	P.	2	1	2 00	Wellington	T.	.....	4	.....
Haliburton	T.	.....	2	.....		P.	4	.....	2 00
	P.	.....	2	.....	Welland	T.	.....	2	.....
Kent	T.	.....	4	.....		P.	3	3	.....
	P.	4	2	.....	York	T.	.....	3	.....
Lambton	T.	.....	3	{ \$1.50 and mile-		P..	4	.....	2 00
	P.	2	1	age.					.....
Carried forward.		39	74		Total		106	143	

Question 9.—How much is paid the Sanitary Inspector per annum, or if not annually, how is he paid ?

County.		Annual salary, S. I. and con- stable.	Paid for work done.	Nothing.	County.		Annual salary S. I. and con- stable.	Paid for work done.	Nothing.
Algoma	T.	2	3	.....	<i>Brought forward</i>		44	44	1
	P.								
Brant	T.	2		.....	Muskoka	T.	3	4	.....
	P.		1			P.			
Bruce	T.	5		.....	Northumberland and				
	P.		6		Durham	T.	2		.....
Carleton.....	T.		1	.....		P.		4	
	P.	1			Norfolk	T.	2		.....
Dufferin	T.			.....		P.			
	P.		1		Ontario	T.	5		.....
Elgin	T.	4		.....		P.		2	
	P.		2		Oxford	T.	3		.....
Essex	T.	3		.....		P.		1	
	P.		1		Peel.....	T.	1		.....
Frontenac	T.	2		.....		P.			
	P.	2	6		Peterboro'	T.	3		.....
Grey	T.		1	.....		P.			
	P.	2	4		Perth	T.	2		.....
Haldimand	T.	1		.....		P.		2	
	P.		2		Prescott	T.			.....
Hastings	T.	1	1	.....		P.		2	
	P.		2		Prince Edward.....	T.	1		.....
Halton	T.	3		.....		P.		1	
	P.		1		Renfrew	T.	2		.....
Huron	T.	1		.....		P.			
	P.		1		Simcoe	T.	3		.....
Haliburton	T.			.....		P.	3	2	.....
	P.		1		Stormont, Dundas				
Kent	T.	3		.....	and Glengarry ..	T.	2	1	.....
	P.	1	5			P.			
Lambton	T.	3		.....	Victoria	T.			.....
	P.					P.		2	
Lanark	T.	3		.....	Waterloo	T.	3	1	.....
	P.	1	1			P.	2		
Leeds and Grenville.....	T.	2		.....	Wentworth	T.	2		.....
	P.		1	1		P.		1	
Lennox & Addington.....	T.	2		.....	Wellington	T.	4		.....
	P.		1			P.	1	2	.....
Lincoln.....	T.	2		.....	Welland.....	T.	2		.....
	P.		1			P.	4		.....
Middlesex	T.	5	1	.....	York	T.	4		.....
	P.	3	3	.....		P.		2	.....
<i>Carried forward</i> .....		..	..	.....	Total		65	33	.....

REPORT ON OUTBREAK OF TYPHOID FEVER IN RAT PORTAGE.

August 2nd, 1898.

Report of the Secretary on Contagious Diseases during the quarter.

Mr. Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—By reference to the published reports which are distributed monthly to every secretary of a Local Board of Health and to every newspaper in the Province, you will notice the absolute deaths returned for each of the notifiable diseases.

The returns for July have not yet been tabulated, the law requiring that they be in by the fifth of each month.

The returns made from day to day to August indicate however a continued low mortality, there being but two notable outbreaks of disease ; one of these at Rat Portage, the subject of special report, and the other in Ottawa.

By comparison with the figures for 1897 representing a smaller population it will be seen that the mortality from scarlatina and diphtheria in 1898 is still lower than the low rate for 1897. Measles has shown a mortality though small in the total, yet rather greater than in 1897. It is notable, however, that the deaths in the city of Ottawa from this disease should in July have risen to nine, or more than for the whole Province in June.

It is quite evident that the measures for suppression exercised are wholly inadequate, and it again brings the question before this Board and the public, How are measles to be controlled ?

From information obtained from various sources, your secretary became aware that typhoid fever had again appeared in Rat Portage. In the thirty days preceding July 20th five deaths had occurred, although not returned by the monthly report to the Registrar-General.

Your secretary, with the approval of the Minister of the Department, visited the district and has endeavored to obtain the facts regarding the outbreak.

From the report made to this Board of the outbreak in 1897, it became apparent that there were two principal sources of the disease.

1st. The polluted bay water along the docks which was used by private parties, by employees on steamboats, and pumped to several hotels and other buildings.

2nd. To the use of water from wells so situated as to be almost certain of contamination.

It will be remembered that the Board has approved of a public water supply, which is being put in at much expense, and will in a few months be available for general use, should the town Council and Local Board deal strongly with the question of closing all wells in any way liable to pollution.

The following facts were developed by the investigation :

1st. That five cases occurred in employees on steamboats.

2nd. That five cases (and probably five more) occurred in C.P.R., employees who used tank water supplied from the polluted bay by a steam pump. The second five cases occurred in employees who may have used polluted water at points along the railroad where they worked.

3rd. At least four cases occurred in a large hotel, which pumped bay water by a steam pump.

4th. The balance of cases, some 15, seemed associated with the use of well-water, but from no particular well.

5th. That at least one physician stated that he had attended some 30 or 40 cases of what he called " malaria."

It was most gratifying to have found that no case was associated with the use of Lake of the Woods water as supplied by licensed water-men from above the town.

It was thus apparent that the prohibition of water from every other source seemed desirable, and will be possible when the water works have been completed. In the meantime, a careful personal investigation by your secretary was made of the different sections of the town, and some 40 water samples taken from wells for examination.

Such investigation, showed a town which has developed remarkably under notable physical difficulties, owing to its hilly and rocky character.

Many streets of well-built houses with new ones springing up on every hand are seen, and while there was room for the extensive operation of the new scavenger by-law to go into operation in September, yet Rat Portage, with a public water works and a sewerage system, with the dry earth-closet by-law enforced, bids fair to become, with its splendid Lake of the Woods, one of the most progressive and healthiest towns in the Province. Your secretary in view of the unsuccessful attempt of the Local Board to deal with a recalcitrant owner of a large hotel, felt it his duty to instruct the County Crown Attorney to prosecute under section 29 of the Public Health Act.

The regrettable fact is again made apparent by the returns, that tuberculosis still claims the majority of victims from contagious disease, and shows for June, a mortality equivalent to that of 1897, although the decrease in some centres, has been so repeated for several months as to be notable.

The Province has been free from smallpox, during the quarter, but the unfortunate condition of the Halifax quarantine management, by which smallpox has gone past in two ship-loads of German immigrants, resulting in detention camps for 1,200 persons in Manitoba for the last two months, indicates with the presence of 15 cases at one point in Ohio, that the disease is not dead, but only awaiting an opportunity for spreading again.

It is appropriate that school authorities should take advantage of the season to require certificates of vaccination from all school children returning to the schools in September.

All of which is respectfully submitted,

(Signed) P. H. BRYCE.

REPORT ON SANATORIA FOR TUBERCULOSIS.

November 30th, 1898.

Quarterly Report of Secretary.

Mr. Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—With regard to the Province of Ontario, it may very well be said, that during the past quarter no sanitary subject has loomed up more largely in the public interest than the problem of the prevention of tuberculosis.

1. Thus we have had the monthly Statistical Report, which has given regularly the total number of deaths which the disease has exacted from our people.

2. The subject received special prominence in the discussion both at the meeting of the Executive Health Officers' meeting, and that of the American Public Health Association in Ottawa.

3. We have had reports of the special steps which are being taken for the establishment of the Citizen's Sanatorium and Hospital for Consumptives in Toronto.

4. The published first annual report of the institution of the National Sanatorium Company at Gravenhurst.

5. Communications from the medical officer of Niagara Falls of the general application of the tuberculin test in the county of Lincoln, to cattle.

6. The reports in the newspapers of the proposal for Homes for Consumptives for Ottawa and Chatham.

The newspapers have had published papers, and extended editorials dealing with different phases of these subjects, and your Board has distributed a large number of copies of your Secretary's paper, "On the duties of the Public in dealing with Tuberculosis."

This activity in so many directions indicates most surely, how thoroughly aroused both the professional and general public have become in this problem of problems, which is receiving as great or greater prominence both in Great Britain, on the Continent and in the United States.

This Board may feel that the educational work which it has done, as illustrated by the series of letters, reports and papers published during the last 16 years, has not only spread useful truths amongst the general public, but also, that the organized public health machinery of the county, state and municipal authorities in Ontario is now beginning to give practical effect to what their people are demanding.

To again present in a condensed manner what are the needs of persons in those occupations, which cannot be said to enable families to maintain for any length of time, their sick without great sacrifice, the following table of occupations has been prepared, which indicates exactly, the degree to which different classes fall victims to this disease in Toronto.

Laborers	147	14 per cent. of all Occupations.
Artizans	288	28 " "
Business men (inc. clerks and travellers).....	124	12 " "
Farmers	29	2 " "
Students (18) School children.....	27	" " "
Professional men (inc. 9 male teachers).....	26	2 " "
Gentlemen	14	1.4 " "
Stenographers, Telegraph and Telephone	15	1.4 " "
Public Officials.....	8	0.8 " "
Sailors.....	6	0.6 " "
Soldiers.....	3	0.3 " "
Convicts	2	0.2 " "
Pedlars	1	0.1 " "

690

Females (only).

Housewives	221	22 per cent. of all Occupations.
Servants	36	3.6 " "
Widows	28	2.8 " "
Milliners and Laundresses	21	2.1 " "
Female Teachers	14	1.4 " "
Nuns.....	14	1.4 " "
Farmer's wives.....	3	0.3 " "

337

Both sexes (under 15 years	737
No occupation given (Female)	395
No occupation (Male).....	105

1,237
2,264

Exclude the following classes of Business men, Professional men, Gentlemen and officials, these being

Business men, which includes 80 book-keepers, salesmen and clerks.....	124
Professional men	26
Gentlemen	14
Public officials	8

172

and the balance (excepting an uncertain number from housewives) or 83 per cent. of the occupations given, belong to those earning a daily wage, and it will appear, how large a proportion of the 2,290 who died within 5 years, an average of 458 annually, are unable to adequately maintain a long financial fight against disease.

How many motherless children are left behind, is seen in the fact of "Housewives" standing prominent as first in the list; and how "Sisters of Mercy" fall victims to this disease in their lives of self-sacrifice, is too truly indicated by the tell-tale records. How many are found from each of the several artisan classes, need not be specially singled out; but what is plain, is that very few indeed in the list are in a position to take advantage of what Dr. Sir William Broadbent, once again points out—"fresh air and fresh air." He has repeated one might say word for word, what we have been teaching for years, and gives illustrations of how such is the only successful method for dealing with tuberculosis.

How far the Government may be prepared to go in aiding such "Homes for Consumptives," need not here be discussed, but it is plain that the disease comes so specially under the list of contagious diseases to be dealt with under the Public Health Act, that local health authorities must of necessity be those who have to take up the practical work in this matter as naturally, and along lines as similar as those dealing with other communicable diseases. When that ponderous body, the London, England, County Council has begun to move positively along the lines of the Royal Commissioners' Report on "Tuberculosis," then may we in Canada with our simpler problems, unhesitatingly deal with and solve them as we have so many other health questions.

So firmly convinced is your committee, that the time has come for an active propaganda for the establishment of County Homes for Consumptives, that it would urge that the Board discuss the plan for arranging for meetings during the coming winter in our principal centres for organizing local committees to act in conjunction with the local health authorities for erecting County Homes in favorable localities.

Regarding the farther problem of local cattle inspection and factory inspection, we may expect work in this direction to go hand in hand with that of taking care of those already tuberculized.

With regard to the work of establishing sanatoria elsewhere, we find Chicago has just opened one with a capacity of 350 beds, especially for the consumptive poor; another has been established by the "Sisters of Mercy" in New York State, New York City has a place for its tuberculous poor, at a cost of \$60,000, and Massachusetts has opened one near Boston.

Turning to England, the number of addresses and editorials in the medical journals of the last two months, dealing with this very subject, is most remarkable. That most remarkable is by Sir William Broadbent, M.D., of St. Mary's Hospital, London, at the opening of the Technical College, Huddersfield. After stating that the total deaths in Huddersfield in 1897, from tuberculosis, was one in every 7.5 deaths, he says:—

"It is often the most gifted, the most useful, the most diligent, the most amiable who are carried off in this way." Is this not so? And then it is so tedious and trying and often so painful and distressing a way of leaving the world; and so expensive too, frequently exhausting the entire resources of a family. "Consumption is one of the products of men's ignorance and carelessness."

"The room or rooms in which a consumptive patient has lived and died, ought immediately to be disinfected under the supervision of the medical officer of health.

To prevent the disease in those with inherited susceptibility, he says:—"The most effectual of these is to live as far as possible in fresh air day and night, summer and winter.

Ventilation is of vital importance, "But it is necessary by night as well as day. "I believe that if we all slept with open windows the mortality from consumption would be reduced by one-half from this alone."

"Nothing can be more efficacious in preventing the spread of consumption, than to cure those already affected by it, unless indeed you kill them off out of the way. Now a great deal more can be done to arrest and cure phthisis, than was formerly supposed possible by means of what is called, and what is in truth the open air treatment." We have become alive to the fact that the curative agent is not any particular air, but simply air. Thus the remedy for consumption lies ready to our hands, and instead of being obtainable by only the favored few, is available for all."

Dr. Broadbent referred to a pamphlet by Dr. Philip of Edinburgh, entitled, "On the universal applicability of the Open-air Treatment of Pulmonary Tuberculosis." Dr. Philip at Edinburgh, Dr. Bredon, living on the Norfolk Coast, Dr. Gibson in Ireland, have showed consumption can be cured in practically all parts of our Islands. "If consumption is preventable, it ought to be prevented—if it is curable it ought to be cured. What is needed for this end is, the erection of suitable sanatoria, and these ought to be provided within easy reach of every large town."

"The construction of these sanatoria will be simple. The one thing about them will be that it shall be impossible to close the windows of any room in them day or night. They need be little more than sleeping sheds; but of course they would be made as cheerful and bright as possible. Patients will spend the entire day in the open air, wet or dry, warm or cold.

"Movable shelters will be provided to shield them from cold winds, and to protect them from the rain.

"On no pretext will he sit indoors. The amount and kind of exercise he may take will be determined by his temperature and strength, and his life will be regulated in every respect."

"No great barrack building will be required. A sanatorium will usually consist of a number of small separate pavilions, which will be erected one after the other." Again he says:—

"The Association which I have the honor to represent as chairman of the organizing committee, has for one of its objects, the promotion of the erection of sanatoria in all parts of the country. It is to be hoped, and indeed confidently expected, that local branches will be formed for the purpose of ministering to local needs. Such branches will collect and expend their own funds, and will erect sanatoria at any suitable spot in the neighborhood so that patients will not have far to go away from home. The special function of the National Association, will be to co-ordinate the work of different branches, to stimulate public interest in the prevention of consumption, and to co-operate with all the agencies which have for their object the promotion of public "health."

"Clergymen and ministers of religion, who see in the way of duty so much of the suffering and distress occasioned by consumption will, we think, eagerly grasp the opportunity of informing themselves how the disease may be combatted and prevented, and of disseminating the information among families, reinforcing the efforts of the medical men. School masters and mistresses again can do much to teach the children the lessons of health and self-preservation."

In the *Lancet's* editorial October 29th on Sir William Broadbent's address, it refers to Lord Vernon's efforts to reform public milk supplies, and to the efforts of the Liverpool, Manchester and London Councils, in dealing with the inspection of meat and milk supplies.

The *Lancet* has further an editorial on "Open air treatment of Tuberculosis for Infirmary Patients," by Dr. N. Raw, Medical Superintendent of Mill Road Infirmary,

Liverpool. He has reported "On the need of the establishment of Sanatoria for the treatment of Tuberculosis. After pointing out how the disease is lessened by sanatoria, Dr. Raw gives figures of the records of the Infirmary." He says for whereas in 1893 of the total number of consumptive patients admitted, numbering 349—there were 121 died, while in 1897-98 there were but 195 admissions, and 88 deaths. Dr. Raw explains the principle of the open-air treatment which he says, "can be carried out in this country, thus obviating the necessity of sending tuberculous patients to seek sunshine and air in foreign lands."

He says:—

1. The building should be well arranged with a southern aspect.
2. A dry, pure, well-drained subsoil.
3. Pure atmosphere and abundant sunshine.
4. A large garden or grounds well protected from wind.
5. Sheltered verandahs facing the sun.
6. Proper supervision.

How this idea of small sanatoria of simplest characters has spread, we see in Dr. LeGendrie of Paris, pleading for a number of small sanatoria, in order to obtain the best results.

Reverting to the problem of what must be dealt with in the class of institutions we have been referring to, the test of occupations given already, and the percentage of those of the working classes, sufficiently answer the problem.

As Dr. Knopf of New York, in a late paper on the "State and Municipal care of Consumptives, says in answer to this question, any government (State or Municipal) must, if it is earnest in its endeavors to control tuberculosis effectually, take upon itself the care and treatment of all curable and incurable cases of tuberculous patients, among the poor and those of limited means. I mean here by limited means, a practical condition which does not permit a tuberculous patient to enter a private sanatorium or to have at home such medical hygiene and dietetic care as will assure him the best possible claim for recovery."

To determine who such are, there should, Mr. Knopf says, be special official medical enquiries to determine—

1. By medical examination, the condition of patients.
2. To institute hygienic measures in his home.
3. To examine other members of the family for initial tuberculosis.
4. To report condition of dwelling to sanitary authorities.
5. To determine the financial state of patient and his family.
6. That where necessary the state may care for patient.

Smallpox.—The past quarter has, as previous ones during the year, been marked by a low mortality from the several contagious diseases. It has, however, been marked by the appearance of smallpox in three municipalities; a convalescent case having escaped from Detroit to Chatham, another person resident in Camden Township (Kent Co.) having brought the disease from Detroit, while a third case came to Cobourg from Rochester. Owing, however, to the measures taken by the local authorities, supplemented by the action of your secretary, there was no extension from the first houses infected in any case. The cases have been:

Chatham	1
Camden	4
Cobourg	1

With the disease present, however, in a number of municipalities in New York State, many cases in Ohio, and cases occurring at times in Michigan, it will be seen that we are likely to have occasional cases introduced into the Province during the winter, and local authorities are advised of the danger from the general neglect to vaccinate school children. With the preparation of glycerinated vaccine now becoming so general, and the use of antiseptic methods in its preparation, there ought to be no hesitation in having this certain preventative against smallpox generally carried out.

The monthly deaths from diseases reported by all Division Registrars show very concisely the actual condition of the public health as regards contagious disease. Your secretary is especially gratified, as Deputy Registrar General, in being able to report that these reports were received from 707 out of 750 municipalities for October, being a report on 97 per cent. of the total population of the Province. This work has steadily gone on, and if the work of the Local Boards were on a par with the assiduity of their secretaries, the present rate of deaths would be still further reduced.

Scarlatina has notably increased in prevalence, the chief centre being, as last year, Toronto. Until actual medical supervision, as is provided in New York, Boston and other places, made by morning visits of medical men to the schools,—and thereafter carefully following up to their homes absentees, and those who may have been exposed in a room where scarlatina, diphtheria, or measles may have been,—it does not seem that any other means will serve to deal effectively with these diseases. To illustrate this point we need only take the results of a year's medical inspection of the schools in Boston, Mass.

	Total Deaths.		
	1894.	1895.	1896.
Diphtheria	817	588	516
Scarlatina	192	114	121

Scarlatina being often mild, no physician is called on, often for fear on the part of the parents that their other children will be isolated and the house placarded. Learning from the schools of absentees would enable the health authorities to ferret out such cases and have them isolated.

Typhoid fever has been more prevalent, as usual, during the past quarter than during any previous quarter of the year. How your Board is going to deal with this prevalence, which is almost wholly in rural districts and villages, where well water is wholly used, is a problem demanding solution. Wells tell still the old story; and the remarkable fact exists, as will be shown in a supplementary report by the bacteriologist of the Board, on an outbreak in one of the oldest and wealthiest townships, that the farm wells of to-day seem to be located with as little regard to health as fifteen years ago, and are subject to pollution in the same way. There seems no present solution, except the radical one of a County Health Officer with plenary powers to institute systematic investigations, and have new wells constructed and located away from the local sources of pollution.

The local nuisance problem in the rural districts and smaller towns equally demands urgent consideration. Such a condition as that illustrated by the report forwarded to this Board by the Department of Agriculture at Ottawa regarding the condition of large piggeries near Ottawa, where the city offal is fed, reveals a state of affairs which your Secretary has again and again vainly attempted to have dealt with by the Local Board of Health. Conditions but little better exist in the neighborhood of all our larger centres, and in spite of the fullest powers to deal with such under the Act, the rural boards have proved utterly useless for the purpose. Raw, putrid offal is systematically fed, although the animals are liable to seizure and a heavy fine for the offence can be levied. Again the county officer with full powers to inspect, suggest remedies, and prosecute for non-compliance is so far as I know the only remedy.

Complaints having been made of the pollution of the Welland Canal waters, which flow from Lake Erie, by the drainage from large swamps in Humberstone and Wainfleet Townships, your secretary visited the district. Welland, Merritton, and St. Catharines all use the canal water as a public supply, and it is essential that such be maintained pure. A full report on the effect of the several pollutions will be made when the investigations are completed.

Several outbreaks of diphtheria have occurred in the back settlements and unorganized districts of Frontenac, Hastings, Muskoka and Parry Sound, which will be found referred to in the correspondence.

REPORT ON TUBERCULOSIS IN ITS RELATION TO MILK PRODUCTS, AND ON INSURANCE SOCIETIES AND CONSUMPTIVE SANATORIA.

Quarterly Report of the Committee on Epidemics.

TORONTO, 31st January, 1899.

Mr. Chairman and Members of the Provincial Board of Health :—

GENTLEMEN,—The past quarter has not been marked by any special prevalence of contagious diseases in the Province, dealt with under Public Health Act, although the remarkable climatic changes of the past month, have been productive of an abnormal prevalence of diseases of the respiratory tract, and notably of Influenza, showing in many instances a markedly infectious character.

Such influences have similarly tended to an increase in diphtheria, of which the monthly reports show 51 deaths or a rate above the average for the year.

Typhoid fever has shown a notable decrease in deaths, there having been in December, only 21 deaths. Reports from Kaladar Township have come to hand, telling of a notable prevalence of the disease for several months past, in the rural district amongst poor settlers, and points to the obvious need of some means of systematic investigation and control superior to that possible in a township with a population of 360 ratepayers, and an assessment of \$73,000 with a tax of 19 mills. Such outbreaks illustrate the absolute necessity for a trained County officer, who could devote the necessary time to the control of such an outbreak.

Scarlatina shows a low incidence during the quarter.

Smallpox is however again present in the Province, while its prevalence in surrounding States, with its appearance in immigrants from a European port, and its presence in Quebec, Manitoba, and British Columbia, all call for the prompt action of the Local Boards of the Province in preparing for its approach by at once taking steps for a general vaccination of our people, who have greatly neglected this precaution since the great Montreal epidemic in 1885.

The statement as seen in the table submitted shows the actual status of the disease in all neighboring states and in the Province.

The scientific progress in the last few years in the preparation of aseptic glycerinated calf-vaccine lymph has made great strides. The Local Government Board of England, has instructed public vaccinators to use glycerinated calf-lymph in preference to humanized lymph.

Health authorities of New York, Chicago, and other places, are preparing and using it; large private firms have it on the market, and your Committee would advise that the proprietor of the Ontario Vaccine Farm, be notified to arrange for the preparation of lymph in a similar manner.

The splendid results of such glycerinated preparations, in successful vaccinations and the absence of suppuration, when the operation is carefully performed, encourage the hope that any apprehension on the part of any person as to the results of vaccination, may be wholly removed. What the unvaccinated are exposed to, is seen in the unfortunate case of the young man in Walford Township, who died on Saturday last. The medical health officer reports the receipt by deceased of a letter from a brother in British Columbia, and written apparently from a house, wherein, as the letter states, "his employer had just died of smallpox." No other sort of contagion seems possible, so far as reports go. Owing to the delay of six days before the nature of the disease was discovered, others of the family are likely to take the disease; neighbors exposed, and there is almost a certainty of a number of more cases occurring. With prompt action by the

local authorities, there is reason to hope that the outbreak will be limited. There will, however, be a serious expense to the municipality involved; yet if municipal authorities and private persons continue to neglect vaccination, such expense may be expected.

Owing to cases reported in Hawkesbury East Tp., Prescott Co., contiguous to the Quebec County of Soulanges, where several cases exist, a Medical Inspector of your Board has been dispatched, to visit the districts where cases are reported, and to take steps to have the local authorities active in the suppression of the outbreak. What further steps may be deemed necessary to be taken in view of the present situation, will be for your Board to determine.

Tuberculosis.—The past year has been marked by remarkable activity in different countries as well as in the Province, in the progress of the movement for suppressing the prevalence of tuberculosis.

This has taken two directions, the one, the establishment of Sanatoria, for treatment and of notification of cases; and the second has been the renewal of the crusade against milk and its products, which may carry the germs of tuberculosis.

English public opinion so conservative, so slow to be aroused to action, yet so characteristically practical when aroused, has, during the past year, years after France, Germany and Denmark have instituted practical measures for dealing with the disease, developed an activity positively surprising. By far the most advanced in its systematic municipal sanitation, which in England has in 30 years caused the mortality from consumption to be reduced 50 %, and has resulted in a death rate in that densely populated country of but 1.3 in the 1,000 or lower in 1896, than Ontario in 1897, the English people, led by His Royal Highness, have declared that tuberculosis is a disease which can be prevented, and therefore must be, and a National Association with him at its head, has been formed to aid municipal establishment of local sanatoria for its treatment. But more than this, they have by a Royal Commission based on experimental evidence, declared that the dairy is a fruitful source of this disease; and experimenters are there daily accumulating further evidence of its truth.

The most recent of such results are those published in the *Lancet* of January 14th, 1899, giving the experiments instituted by Prof. H. H. Kanthack, Professor of Pathology, Cambridge University, and who has died almost on the completion of the work.

The investigation was begun in April, 1898, as to the effects of the milk supply sent daily to the different colleges of that city. Daily samples were taken direct from the milk cans of vendors, and from a half to a drachm of the creamy portion, and of the sediment were injected into the groin of guinea-pigs, each into a separate animal. Microscopic examinations were also made of each sample.

Summed up, the following results were obtained: Of the ninety guinea-pigs inoculated, twenty-three died, or 25.05 per cent. Of these, thirteen were from the creamy layer, and ten from the sediment.

Of the sixteen dairies examined, all supplying mixed milk, nine supplied milk which caused tuberculosis. The report states: "It is therefore not unreasonable to regard these dairies as a grave source of danger."

The same number of the *Lancet*, in its Berlin correspondence, gives the latest results of experiments at the Imperial Hygienic Institute, on tubercle bacilli in butter. Dr. Obermuller found bacilli in each of fourteen samples supplied by the same tradesman. Dr. Hermann found it in fifty per cent. of ten samples from three shops. Dr. Petre, of the Imperial Health Office, found them in 32.3 per cent of ten. samples from different shops.

Dr. Lydia Rabinowitch found in one set of samples seventy per cent., and in another set from the same shop one hundred per cent. containing bacilli. All the animals inoculated with this butter produced typical symptoms of tuberculosis.

It was remarked that the most numerous and virulent samples were from the principal shops in Berlin.

Remembering the long repeated and strenuous endeavors of this Board to point out to the public, and to local health authorities, the danger from infected milk products, remembering that the actual deaths in Ontario from diseases returned as tuberculosis have reached in 1897 for the first time 3,000, or 3,154 exactly ; remembering that in the class returned as infantile debility, atrophy and premature births of children under one year, many, and probably most of which were tubercular, there were 2,279 deaths, 1,709 congenital debility, 574 other diseases of infancy ; remembering that this class of diseases in England has not decreased notably, while consumption proper is lower than in Ontario ; it seems regrettable in the extreme, that after all efforts put forth, but two, or at the most three, of our 747 municipalities have attempted to deal with the question of milk from tubercular cows. And is it to be wondered at, when we see one of the leading dailies, which wields so potent an influence upon public opinion, publishing twice within the past few months, articles on the "Tuberculosis Scare," making statements showing apparently a marvellous ignorance of facts, which have been abundantly illustrated in a hundred laboratories, and by the tell-tale statistics of the registration returns of every country and large city in the world ?

We have seen years of neglect of cattle inspection result in the embargo being placed on Canadian cattle in England ; we have seen, to remedy the exclusion of American bacon from Germany, an elaborate Governmental system of inspection in the United States of hogs for export, and now we see added to this a close inspection of all dead meat for export from that country, establishing for them a reputation Canada will not readily establish, if she does not follow with similar work.

Now, we hold largely the cheese market of Britain, and hope to gain the butter market. But if we are to maintain our present position, if we are to gain what we are longing to obtain, surely those who are seemingly prepared to close their eyes to what affects the lives of our own people, will begin to see that the interests of true commercial enterprise demand that we send commercial products to foreign countries with such an assured wholesomeness that there will be no danger of our losing what it has taken such great pains to obtain.

In the report of Dr. McEachren published in August, 1898, by authority of the Minister of Agriculture, Ottawa, the magnificent commercial results of the scientific production of milk in Berlin, and of the Milk Supply Company of Copenhagen, are illustrated, and if it were necessary the results of similar methods in use on this continent could be quoted to amply indicate that any attempt at reactionary methods, whether private, municipal or governmental in this work, based upon science, must to-day end disastrously and in commercial loss.

That these views will be borne out in practice may indeed be further argued from what has appeared in the to day's telegraphic despatches from Britain in which the committee of the British Medical Association appointed to consider the tuberculosis question is reported as stating that municipal authority should be exercised, 1st to prevent any house from being built unless it be on a dry site and foundation, with sufficient space to admit free sunlight and air ; 2nd that such authorities should be empowered and required to construct municipal abattoirs and that killing of meat be prevented elsewhere ; and 3rd that inspection of cowsheds and cows should be regularly carried out and that all milk for public use should be prohibited, where the tuberculin test had not been applied.

Sanatoria for Consumptives.—The agitation for the erection of sanatoria has developed with amazing rapidity. Although such have existed for years it is but very recently that their development has become systematized. As in so many other scientific phases of Medicine, Germany has led the van in this work, and it has been curiously illustrative of the intimate relationship which the financial aspect has with sanitary development.

As early as 1867, Dr. Schæffle began the agitation there through his writings for compulsory workmen's insurance. The Hon. Joseph Chamberlain in England has agitated for it, and claims that though such insurance be socialistic, it is less harmful as Schæffle asserts, than are existing forms of charity.

When the bill re compulsory workingmen's insurance was being debated in Germany in 1881, Bismarck said, "Call it socialism or whatever you like, it is the same to me." Up to this time, great development of insurance through friendly societies had taken place, but in 1883, compulsory insurance for sickness and accidents became a part of Imperial Legislation. The bill was intended to apply as early as practicable to 12,000,000 people. Under the bill all laborers, artisans, post and telegraph operators, soldiers and sailors and others whose daily wage does not exceed $6\frac{2}{3}$ marks (or \$1.59) were included. There are commercial, local and state insurance organizations, as well as those of different classes of artisan or guild and free associations or friendly societies. The largest are the commercial, probably over 40 per cent. belong to these.

Every man obliged to insure belongs to that local factory, guild, or other association which exists where he works.

The contributions are based upon the rate of wages, it may be up to 2 per cent. of their wages. The expenses of any association must in no instance be more than $4\frac{1}{2}$ per cent. of the wages.

The aid given varies in different associations to different classes of persons.

The minimum sick pay is 50 per cent. of the average wage, and the limit of its payment is usually up to thirteen weeks, but may continue for a year. Instead of medical attendance and sick pay, free treatment in an hospital may be given. In the case of death twenty times the amount of wages of common laborers is given, and in no case more than forty times the amount of this sum.

In 1891 the cost of sickness in the different associations amounted to..

\$21,312,610 00 = 90.61 per cent.

Cost of administration 1,175,968 00 = 6.02 "

Expense for number insured in 1891 3.58 "

Total associations in 1891 21,498.

Cost of medical attendance and medicine, 1891 \$7,399,125.

These figures have been given in semi-detail in order that the scope of these associations may be understood and that their relation to the growth of the sanatoria for Consumptives may be seen.

Since the institution at Gorborsdorf, in 1862, of Brehmer's Sanatorium, and of Detweiler's at Falkenstein a few years later, it has gradually come to be understood that consumption dealt with promptly and intelligently is in large measure a curable disease. In one report which has come to hand of the operations of Dr. Weicker's Sanatorium at Gorborsdorf, for 1897, where there are now several of these institutions, it appears that 547 were treated in 1896 of whom 62 only were supplied wholly by the insurance companies. Of the other 485 cases the daily cost was 3.96 marks, of which 121 m. was private funds and the balance 2.75 m. supplied by the insurance companies were sent there by some of these insurance societies. The term there for which they received the sick benefits was 13 weeks. At 50 per cent. of the wage \$1.59, they would be paid \$5.60 a week, so that it will be seen that an ample amount was paid, if it all went to the sanatorium for their care. The remarkable fact is stated in the report that of the workmen thus sent away, 80 per cent. were reported so cured in 13 weeks treatment as to resume work, the workpeople doing better than the others comparatively. One reason being given, viz, that they were sent early. Many interesting details might be given from this report but the chief one is that of the fresh-air treatment and strict sanitary regimen, with easy tasks interspersed with recreation.

To what an extent these sanatoria are being utilized by the insurance societies in Germany, from the purely commercial standpoint, that of saving money in death claims, may be gathered from the fact that in 1898, they have paid between three and four million marks for the maintenance and erection of such sanatoria for the people or nearly a million dollars. As stated in a recent number of the *Lancet*, elaborate statistics are given by one institution of 1,541 phthisical patients, showing that general improvement has taken place in 85.5 per cent., local improvement in 61.1 per cent., complete restora-

tion of working capacity in 71.8 per cent. In 15.5 local signs, slight on admission disappeared, 15.4 local signs remained unchanged, and in only 6.6 per cent. did local signs increase. It is also shown that a large proportion of those treated in former years remained well. These statistics are given of sanatoria, not in mountain regions only but in the best selected sites in various localities.

We are thus brought again to the subject of dealing with such in our own Province. In the five years' statistics of deaths in Toronto, ending 1898, it was shown that some 80 per cent. belonged to the artisan classes most of whom are in positions comparable to those treated in Germany, and whose deaths leave so many families dependent on charity. How shall the matter best be taken up in our Province? At present we have no compulsory insurance law, but we have hundreds of friendly societies. Surely the local health authorities may be expected to aid in the establishment of institutions, where these societies may be expected from the purely financial standpoint, apart from that of brotherhood, to supply the funds for the care of their sick, while others would be similarly maintained by friends and the church organizations to which they belong.

QUARTERLY LABORATORY REPORT.

By J. J. Mackenzie, B.A.

[Toronto, May 19th, 1898.

The Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—In connection with the work in the laboratory of the Board, I beg to present a report of the work done in the five months ending April 15th. I select that period, as it includes the winter months, and will show the extent to which the work has increased.

In presenting this report, I wish to especially call attention to the necessity of the Board taking some steps to either lessen the amount of routine work, or to provide means to overtake it, as matters have now reached such a point that I find myself unable to overtake all that is sent in, and I cannot find time for the more important scientific investigations which are continually presenting themselves, and which would be of special interest to the Board, if carried out in its laboratory.

I have endeavored, also, as showing the methods pursued elsewhere, to collect data as to the laboratory work done by other Provincial and State Boards of Health.

During the past five months, there have been examined in the laboratory, 581 samples of suspected diphtheria; 58 samples of suspected tuberculous sputum; 31 samples of suspected typhoid blood; 74 samples of water, and 44 miscellaneous examinations. This is an average per month of—

Diphtheria swabs	116
Water samples	15
Sputum	10
Typhoid	6
Miscellaneous	8
Total	155

In addition to this, I have (excepting the serum for the diphtheria examinations) to make up all my own media and prepare all the other material used in the laboratory, and also carry on the clerical work of reporting results. That the work will continue to increase is to be expected, and this increase will become more rapid as the districts availing themselves of the laboratory, become more numerous. The effect of this press of work has been that reports are delayed; that sufficient time cannot be given to the work, and that special investigations are absolutely stopped.

I began over a year ago an investigation upon rabies, which I have been compelled reluctantly to give up in spite of the fact that I have succeeded in accumulating a lot of valuable material, if only time could be obtained to work at it.

The question of antitoxin tests is of pressing importance, but so far only one sample has been tested, a report of which was presented at the last meeting of the Board.

The question of formaldehyde disinfection, and the most practical methods to be used under the conditions obtainable in Ontario, is another subject which should have been taken up before this.

In the matter of bacteriological water analysis, I feel particularly the need of time. Every sample of water requires to be studied specially from a bacteriological standpoint, and may be considered in each case the subject of a special investigation, but at present we must content ourselves with a quantitative examination, and a very cursory qualitative examination, with the result that it is difficult sometimes to give a safe opinion upon the water. A point of more than ordinary interest, is the bacteriology of our northern Ontario brown waters, and the behaviour of pathogenic bacteria in them, and until the question is thoroughly studied, we may say we have a quantity of unknown conditions present of a hygienic character, which render difficult the questions of pollution and potability of these waters.

There are two possible solutions in this question, one is to put a certain restraint on the work by charging a small fee which would be applied to meeting the expense of the laboratory; the other is by giving the assistance necessary to carry on the work.

The first method is the one pursued in a good many States, but it would be difficult to retire from the position which we have taken, of doing the work gratis.

The second method must be resorted to sooner or later, even if fees are charged.

I have prepared a short statement of the methods pursued elsewhere, which is as follows:

In Quebec there is a chemist and bacteriologist employed by the Board, who are paid a retaining fee, and receive the fees for the work done. They each depend for assistance chiefly upon that which they receive from their University or hospital positions.

Fees charged are as follows:—

Water—Chemical	\$15 00
“ Biological	15 00
“ Combined	25 00
Milk—Chemical	5 00
Sputum	5 00
Meat	5 00
Special	\$10 00 to 20 00

In Michigan the large staff of the State University is used, and fees are charged for the work done.

In Pennsylvania there are two chemists and two bacteriologists, besides assistants. These officials hold other positions, but devote a certain time to State work. The State charges fees as follows for each sample of water, chemical or bacteriological, \$7.50.

For private diphtheria examinations, \$1.50. Every municipality can, however arrange for diphtheria examinations by paying according to population, as follows:

5,000	\$ 15 00 per annum.
10,000	25 00 “
15,000	30 00 “
20,000	35 00 “
25,000	40 00 “
30,000	45 00 “
50,000	50 00 “
Over 50,000	100 00 “

In Massachusetts no fee is charged, and the state maintains a staff of sixteen to do chemical and bacteriological work, with the result that the Massachusetts State Board of Health are everywhere considered the most valuable sanitary publications in the world.

In New Jersey there is no chemical work done by the board, the bacteriological work is done free of charge by a chief bacteriologist and assistants.

In New York chemical analyses of water are done by the board. The bacteriological work of the board is done outside and fees are paid.

In Wisconsin a State chemist with assistants does the chemical work. There is a consulting bacteriologist paid by and the secretary of the board does diphtheria and sputum free of charge.

In Indiana the work is done free of charge to municipalities, but is paid for by the State, the State board reserving the right to refuse to do work if appropriation is expended.

In Ohio the State chemist does the analytical work free of charge, and they are now endeavoring to obtain the appointment of a bacteriologist.

In Minnesota the work is done free of charge; there is a State bacteriologist who does no chemical work and who has three assistants.

It will be seen from this brief synopsis that in some States fees are charged, in others none; but in all cases it will be noted that a much larger staff is required to do the work in practically every instance where the chemical work is separated from the bacteriological.

What is required here is that the chemical work should be separated. Not only does it break into the ordinary bacteriological work, but also no chemical analysis to be accurate should be made in a bacteriological laboratory. There is required also an assistant, who would be able to do a certain amount of the routine work of making media, making diphtheria and sputum preparation for examination (under control of course), and reporting of results.

If this were done, the value of the laboratory to the Board would be enormously increased, and work could be carried out of much more lasting benefit to sanitary science than the mere routine examination of swabs and sputum.

OUTBREAK OF TYPHOID FEVER IN HAMILTON TOWNSHIP, DURHAM COUNTY.

By J. J. Mackenzie, B.A.

Toronto, Nov. 29th, 1898.

To the Secretary, Provincial Board of Health :

DEAR SIR,—I beg to submit a preliminary report upon an outbreak of typhoid in the Townships of Hamilton and Hope which I have been investigating.

The outbreak has been chiefly in the Township of Hamilton and is confined to nine houses within a comparatively limited area set forth in diagram; in all there were twenty-one cases with one death.

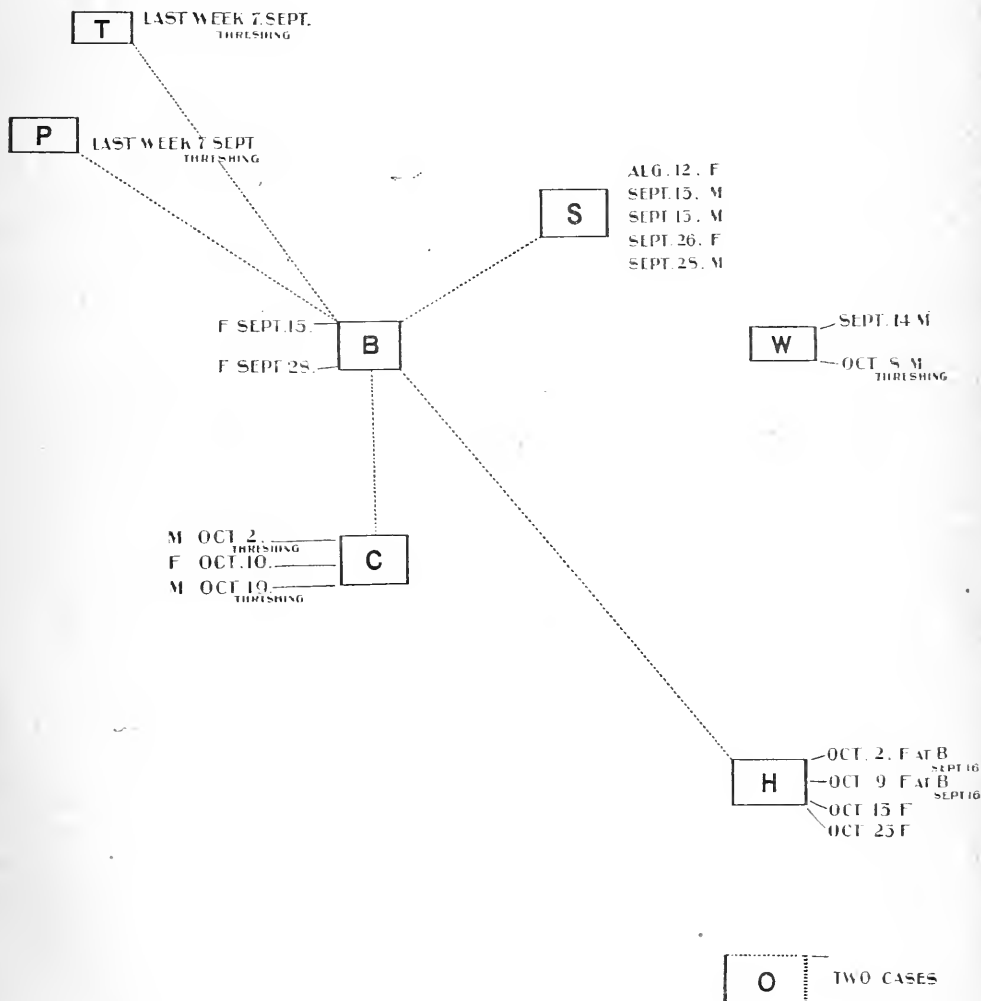
The outbreak began with a case in the S—— household on Aug. 12. In regard to this first case, I could not find any history of exposure to infection. The patient had been in Port Hope for a few hours on one or two occasions but had been chiefly at home.

The next case developed in the same household on Sept. 13, a third on Sept. 15 and two more before the end of the month.

On Sept. 15 a case developed in the B—— house, situated a few hundred yards from the first house and in a family using water from the S—— well.

On Sept. 12th there was a threshing bee at the B—— house and the water used came from the S—— well, and of twelve who were present six took typhoid. It would look as if this threshing were the opportunity for infection and the cause of infection the water of the S—— well which was used by the threshers. Unfortunately for this

DIAGRAM SHOWING POSITION OF HOUSES WHEREIN OCCURRED
CASES OF TYPHOID FEVER IN HAMILTON TOWNSHIP.



theory, however, the cases developed somewhat late. Taking all the 21 cases by weeks the incidence was as follows :

Week ending Aug. 13.....	1 case.	(S——.)
“ Aug. 20.....	None.	
“ Aug. 27.....	None.	
“ Sept. 3.....	None.	
“ Sept. 10.....	None.	
“ Sept. 17.....	4 cases.	{ S—— 2. W—— 1. B—— 1.
“ Sept. 24.....	2 cases.	{ T—— 1. P—— 1.
“ Oct. 1.....	3 cases.	{ S—— 3. B—— 1. C—— 1.
“ Oct. 8.....	4 cases.	{ H—— 1. W—— 1. H—— 1.
“ Oct. 15.....	3 cases.	{ H—— 2. C—— 1.
“ Oct. 22.....	1 case.	{ C—— 1.
“ Oct. 29.....	1 case.	{ H—— 1.

Finally two cases which I have no date for as yet.

Of the cases which might be traced to drinking water at the threshing two developed within two weeks, one three weeks, one three weeks and six days and one five weeks and three days.

There were four cases in the H—— household, all females. The first two had been at the B—— house about Sept. 16th, and probably drank the water there ; they developed typhoid two weeks and three weeks later. Two others developed in the same household, one Oct. 13th and the other Oct. 23rd.

There is finally a case, W—— who developed the disease on Sept. 14th and who was not at the threshing. This case was a boy and the father was at the threshing and developed but not for three weeks and six days after.

It was difficult to obtain exact facts as to the extent to which these cases visited either of the infected houses, but I think it is probable that there was more exposure than is indicated.

In regard to the general features of the outbreak it is to be noted that the first case preceded the others by over a month. It also preceded the other cases in the same household by the same period, and beginning with Sept. 12th and taking the period until Sept 30th, of nine cases which developed, six are known to have used the S—— well constantly, whilst two used at the threshing. One only remains in doubt as to the infection.

It seems probable, therefore, that the water of the S—— well became infected between Aug. 12th and Sept. 12th, and that a fair proportion of the cases were due to the use of this infected water.

The well is situated in the yard near the kitchen, it is about 30 feet deep through clay and has a good supply. Is not known to go dry. Fifty-seven feet away is the privy box, a dry earth affair, which is however only cleaned spring and fall. About the same distance is the stable and ground around the well is in a very filthy condition.

An analysis has not yet been made of the water, but I have no doubt it will turn out to be bad.

The meteorological conditions do not seem to throw much light on the cause of the outbreak except that the weather was exceptionally hot during the first four days of September and there was rain at Port Hope on the 4th, 5th and 6th.

It is probable that a certain number of cases which occurred after Oct. 9th was due to direct infection from previous cases in the same household, as in all cases there were cases already in these houses.

The cases according to families were as follows :

S—— family.....	5	H—— family.....	4	T—— family.....	1
B—— “.....	2	W—— “.....	2	P—— “.....	1
C—— “.....	3	A—— “.....	1	O—— “.....	2


THE DISINFECTION OF THE DOMICILES OF TUBERCULAR PATIENTS.

November 30th, 1898.

By J. J. Cassidy, M.D.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—The necessity of disinfecting the domiciles of persons who die of tuberculosis, or even rooms in houses which have been temporarily occupied by tubercular patients seems obvious enough to sanitary authorities. And the reason for that is simply because we believe that tuberculosis is a disease which may be transmitted from one person to another. Remove the cause and the effect disappears. In fact, one of the postulates of sanitary science in reference to the prevention of tuberculosis is : Remove the bacilli tuberculosis from inhabited places, prevent the deposition of fresh bacilli therein and a vast diminution in cases of tuberculosis will soon be apparent. This doctrine has not yet received the adhesion of all physicians, some of whom are incredulous of the transmission theory and believe that tuberculosis is caused by a degeneration of the organism resulting from hereditary weakness, overwork or excesses, together with insufficient or improper nourishment. Needless to say, a layman who derives his views and the etiology of the disease in question from such a professional source will not notify the municipal health department that a tubercular son or daughter has occupied a room or rooms in his house. Neither will a hotel-keeper inform the health department that a tubercular guest, who has gone south for the winter or become an inmate of a sanatorium in Ontario, occupied a room in his house for several months. To overcome this obstacle I would recommend that tuberculosis be made a notifiable disease, the subsequent management of any given case to be conducted so as to obtain the best result whether in a domicile or at a sanatorium. Owing to the wide prevalence of tuberculosis in Ontario, there being an annual mortality from that disease of 2,757 in 1896, it is most important that notification should be given to the civic health authorities, because no matter what the termination the case might be, the disinfectors could take suitable means in the infected locality to destroy the bacilli which are the active agents in propagating the disease.

 In order to ascertain the practice among Ontario health officers in this matter a circular letter, asking if disinfection of the domiciles of tubercular cases is done by the civic health department and in what manner, was sent by me to the medical health officers of Toronto, Hamilton, London and Kingston. The following replies have been received :—

TORONTO, November 25th, 1898.]

DR. CASSIDY,
69 Bloor St., East, City.

DEAR DOCTOR CASSIDY—In reply to your communication of November 23rd, I desire to state that in a number of cases disinfection of the domicile after tuberculosis patients have died or vacated the premises is asked for and done by the department, in which cases the rooms are disinfected with 1 to 1000 of bichloride, and the bedding, etc., by steam sterilizer.

Faithfully yours,

CHARLES SHEARD, M.D.,

Medical Health Officer.

HAMILTON, ONT., November 28th, 1898.

DEAR DR.—No disinfection has been applied for after the death or removal of a tubercular patient in this city.

Yours respectfully,

L. RYALL,
Medical Health Officer.

J. J. CASSIDY, ESQ., M.D.,
Member Provincial Board of Health,
Toronto.

LONDON, ONT., November 29th, 1898.

MY DEAR DOCTOR—Concerning tuberculosis. Disinfection after death from tuberculosis or removal of patient of house, dwelling or home has been asked for only three times during the year in this city. Formaldehyde was the agent used. I am doing my utmost to educate the people up to the necessity of disinfecting, isolating and in every way circumscribing the direful ravages of this disease.

Yours very truly,

T. G. HUTCHINSON,
Medical Health Officer.

J. J. CASSIDY, ESQ., M.D.

KINGSTON, ONT., November 28th, 1898.

DEAR DOCTOR—In reply to your enquiry. My answer is, no.

Your obedient servant,

SAMUEL H. FEE,
Medical Health Officer.

BROCKVILLE, ONT.

Dr. Vaux had one case in which application for disinfection was asked for after death of a patient.

It is quite evident from these replies, that this most important feature in the prevention of tuberculosis is neglected in Ontario. As illustrative of what might be done to decrease the prevalence of tuberculosis in this country, I shall read you an abstract which I have made of the Parisian method of disinfecting the domiciles of the tubercular poor. At the congress of tuberculosis, held at Paris, last July, Dr. [A. J. Martin, Inspector General of the health department of that city, read a paper, descriptive of the efforts made to restrict human tuberculosis by procuring the disinfection of the lodgings, occupied by tubercular patients. He endorsed the recommendation of the French Academy of Medicine, which favoured (1) the use of spittoons for the pocket or the apartment; (2) the disuse of sweeping and the use of a damp mop for cleansing floors; (3) disinfection of the domicile after a patient's death, or even after a short occupation of the premises by a tubercular patient, and also disinfection of the body linen, bed linen, etc. After describing the present status of gaseous disinfection by sulphur or formaldehyde, Dr. Martin gives the preference to the washing or spraying of surfaces with antiseptic liquids. Washing or spraying, the latter especially, if done in a careful manner by practised hands, possess the double advantage of securing the cleanliness of

the place to be disinfected, and rendering it habitable in a relatively short period. The necessary displacement of the furniture, also brings into notice portions of the room, which, too frequently remain in a flagrant condition of filth. Floors are scrubbed or mopped. Whitewashed walls and ceilings are retouched. Where the walls are papered, antiseptic sprays of mercuric chloride and chloride of sodium are used, and a sterilizing of tubercular dust has been thus obtained, equal to what has resulted from a lengthy contact of the surfaces of a room with an antiseptic gas. The principal antiseptics used are :—Fresh milk of lime ; solution of chloride of lime ; (100 grains of commercial chloride of lime to 1,200 grains of water, then, after filtration, dilute to a strength of 1 in 10 ; solution of commercial formol, 5 grains to the liter of water ; solution of carbolic acid, 5 per cent. ; solution of cresyl, 5 per cent. ; wood vinegar ; solutions of soap, and especially the solution of mercuric chloride mixed with chloride of sodium, which, as Miquel has recently shown procures the definite and immediate sterilizing of tubercular sputa, owing to the property possessed by the chloride of sodium of dissolving the insoluble albuminate of mercury.

The disinfection of domiciles for tuberculosis has now been in operation in Paris for six years. The number of disinfectants asked for or accepted, was 4,541 in 1892 ; 8,128 in 1893 ; 7,514 in 1894 ; 9,225 in 1895 ; 9,330 in 1896 ; 10,194 in 1897 and 6,979 in the first half of 1898. These figures will be increased during the second half of the present year, because the sanitary authorities of Paris intend to extend, experimentally, to an entire arrondissement of the city the preventive measures, which have been applied systematically to the tubercular poor, who have been cared for in their own homes. Over two years ago the French Commission on tuberculosis had recommended a certain number of preventive measures to be put in force in the case of poor people treated in their own homes. Closely adhering to the instructions of the commission the following plan of action was adopted: (1) Two spittoons were placed in the domicile of each patient. After different trials, the department decided in favor of a colored glass article, flat-bottomed and formed of two opposite cones, it is made so that, the fingers are protected against soiling by the expectoration, which drops easily into the contained liquid and it is steady enough to be placed near the patient, who, in many cases, is often left alone in his room. It seems to answer better than the heavier articles, formerly in use, for which the patients substituted a wash-basin or enamelled spittoons. (2) A certain amount of liquid should be left in the spittoon. This regulation has been generally observed, but, in a good many cases, the patients have objected to carbolic acid on account of its disagreeable odour increasing their cough. Then water is therefore used instead. (3) The spittoon should be cleaned every day, by putting it into cold water, which is subsequently raised to the boiling point. The physicians, however, unanimously recommend, that the spittoons should be emptied into the water closets and then rinsed out. The department agree to this innovation, being convinced that in the houses of the poor, it is often impossible to obtain the cleansing of a spittoon with boiling water, as frequently the necessary kitchen utensils are lacking and for the greater part of the year a fire is not available. (4). Soiled linen ought to be steeped in boiling water for five minutes. For reasons similar to those last given, in nine-tenths of the cases, this precaution could not be observed. Where conveniences were wanting, the department recommend that the soiled articles be put aside, so that they could be disinfected by the municipal sanitary service. This was done and without much trouble, save in one of the quarters of Paris, where the tubercular poor had no linen to wash. The public assistance will assuredly interfere to provide for such a lack of clothing. (5) After death, cure or departure, the disinfecting service perform the usual offices without much difficulty. The disinfectors go at least once a week to the domicile of each patient. They exchange disinfected linen for the soiled linen, which they carry off to the disinfecting machine ; the water closets and utensils, used by the patients, are cleansed with antiseptic fluids.

The greatest obstacle to practical disinfection has been the notification of the patient's disease to the authorities. Soon after notification the patient was considered, as if he were a leper and, in some instances, was expelled from his lodgings. Thus the disinfecting operations were not regularly and completely carried out, except in a little over 50 per cent. of the cases. It was the same after a death. These difficulties, however, were

noticed only in some places. The spittoons and disinfection were accepted and even asked for in three arrondissements, in two other arrondissements, however, some ignorant or evil-minded neighbors caused the failure of the municipal preventive measures. "The spittoon is a great success, says one of the physicians, who have taken most interest in introducing it, because it collects all the contagious droppings, which, formerly, were discharged at the caprice of the patients, and most frequently on the floor of his room. Our tubercular cases accept freely the spittoons and the weekly cleansing of the water-closets. The sanitary service does the work with regularity."

The regular disinfection of consulting rooms, houses of refuge, civic offices or places frequented by the tubercular poor is done without difficulty. Whenever a tubercular patient is admitted into a hospital, notification by telephone is sent to the civic health authorities, who immediately despatch the disinfectors to do the necessary work at his vacated domicile. These officials are not in all cases permitted to do this office, for the simple reason, that the transmission of tuberculosis from one person to another is still very far from being believed in by the Parisian people.

Such are the measures which will be systematically applied, as fully as possible, in one of the arrondissements of Paris, and, doubtless, later on in others. Joined to disinfection directly asked for or accepted after a death has occurred or during the course of a patient's illness, as well as disinfection of lodging, after location and before inhabitation, which is asked for more and more every day, the sanitary resources of the French capital against tuberculosis will be very much strengthened and improved. As Dr. Martin says, the principal obstacle to practical disinfection in Paris, has been the notification of the patient's disease to the health authorities. This arose from the unreasoning terror of some persons when confronted with the dread word "contagion." The only remedy for ignorance is instruction, and when people in Ontario learn how the contagion of tuberculosis is acquired they will not object to the systematic removal of the sources of that contagion. Physicians should frankly say that tuberculosis is contagious, but they should explain how, when and why contagion takes place. Information should be given the public about phthisis just in the same way as about scarlatina, typhoid fever or diphtheria. That this has been done of late is quite true. The medical press has teemed with articles on the prophylaxis of tuberculosis, and, as you are aware, important papers have been read on this subject by members of this Board. The ready response made in Toronto to a call for the establishment of a home for consumptives shows that the public taste has been influenced by the medical opinion. The Sanatorium for the consumptive has come to stay. Patients sent to Sanatoriums must, however, be those who are in the first or second stage of phthisis. Advanced cases would not be benefited by Sanatorium treatment and would probably increase the labours of the attendants, with a corresponding increase in the mortality statistics of these institutions. Such advanced cases will therefore be treated in their own domiciles or in an hospital. In the former case the civic health department should be notified by the attending physician, or in case no physician is called, by the householder, so that when the rooms are vacated the disinfectors may take possession and do the necessary work. In case the patient goes to an hospital or sanitarium, notice should be sent from the institution selected to the civic health department of the municipality to which the patient belongs, so that similar precautions may be taken. It is not possible to struggle successfully with an enemy like tuberculosis if the field of battle is enveloped in darkness. If hygiene is to do satisfactory work in reducing the mortality from tuberculosis the leading feature of the campaign must be prevention and the first and most important step in that direction is to apply the search-light of notification, after which disinfection logically follows.

Vide sections 81, 82, 83, Ont. P. H. A.

Vide section 13, Rule 3, Ont. P. H. A.

THE PLACE OF SOCIETY IN DEALING WITH CONSUMPTION.*

By P. H. Bryce, M.A., M.D.

Your Excellencies, President and Ladies of the National Council of Women :

LADIES AND GENTLEMEN,—Some months ago, in Philadelphia, I presented a paper before the International American Public Health Association, whose annual meeting, I am pleased to know, is to meet in Ottawa in September next, on "The Place of the State in dealing with Tuberculosis," in which I endeavored to indicate by illustrations from methods actually existing in Ontario during the last twenty-five years, dealing with the insane, the feeble-minded, the aged and the sick poor, what I conceived to be the relations of state and municipal authorities to a disease which causes in Ontario annually some twelve per cent. of all the deaths, more than twice as many as all the deaths from the several other contagious diseases reported monthly; slays annually a total equal to three fifths of the total inmates of the seven Provincial institutions for the insane, whose exclusive demand for their yearly maintenance is \$595,843.13.

This disease of consumption has at the present moment, at a moderate estimate, 6,000 persons, adolescents and adults, within its grasp in the Province of Ontario, and will within the year have seen some 3,000 of them "Cross the bar;" while under present conditions at least 3,000 more of their comrades will have silently stepped forward to fill up the gaps, which this most fatal of weapons forged has made in the ranks, notably of those at an age capable of bearing arms. To-night, speaking as I do to an audience assembled under the auspices of an Association, the moral sense of the women,—indeed I might say the people of Canada, I shall endeavor to set forth the place which society itself, which elects and instructs her representatives, whether state or municipal, finally in all matters occupies in relation to this disease, which bears so heavily upon it, whether as an aggregation or as individuals.

In a very remarkable work entitled, "The Ascent of Man," by Henry Drummond, D.D., lately deceased, he has drawn a very neat and important distinction in relation to that problem of problems, the evolution of the world, of its inhabitants—indeed of society. Ever since Darwin's "Descent of Man," published in 1862, we have had set before us as the one "thing of life" and the condition of progress, viz.: the "Struggle for existence," and introduced into what we call Sociology it is the basis of the argument for the "Competitive system" which we are asked to recognize as the principle underlying all modern progress, and to excuse every form of individual or collective slavery, which grosser selfishness may cause to grow therefrom. Another law inevitably and unalterably associated with this which Drummond calls "The Struggle for the Life of Others"—the theory of "Altruism"—arises out of the fundamental functions of living organisms upon which existence depends. The two seen together appear in their simplest forms, viz., in the mother as nutrition, or the struggle for her own existence, and, if life or the race is to continue, equally the struggle by her to nourish and maintain life in her offspring. Hence "altruism," the very theory expressed in the words of the Divine Master, which have been adopted as the motto of the National Council of Women, "Do unto others as ye would that others do unto you," is being realized as having as scientific a basis as that other primal law, the struggle for life, both of which are indissolubly bound up in every complete scientific scheme by which society does not only exist, but struggles to evolve a higher life, a nobler ideal, a greater progress, whether viewed from the physical, material and commercial, or social and moral standpoint.

Without attempting to elaborate what I know this audience will agree with me in believing as axiomatic truths, it will, however, be of interest to us to apply these principles to the subjects under discussion to-night.

If we investigate the causation of disease we very soon discover that they have their natural history, just as do plants and animals, as have the rise and fall of inland streams, as indeed the flow and ebb of the tides. Cholera, yellow fever and malaria exist in countries where they may be said to be indigenous by virtue of the conditions of soil pollu-

* An Address before the National Council of Women at Ottawa, May 17th, 1893.

tion and organic decay in tropical climates; scurvy finds its victims within the sub-arctics where men are deprived of vegetable foods, and tuberculosis especially prevails in temperate climates, and in populous centres where imperfect nutrition and mal-nutrition are too often associated with the fierce competition, not for subsistence so much even as for wealth. Yet as plants and animals of one climate may be acclimatized in another, or may become extinct in their native habitat by the persistent pursuit of enemies, or by removal to another and unfavorable environment, so we find that cholera has again and again burst forth as an epidemic even in temperate climates, scurvy has appeared in tropical prisons, and consumption has become domiciled in the cottage of the settler planted on the illimitable prairie. In all life, therefore, whether of the disease germ or of man, we have the normal individual, the individual as affected by heredity, and the individual as influenced by his environment.

Keeping these seeming common-places before us, I think we shall be able to clearly comprehend why it is that the haunts of nature, as yet untouched, inviolate and free from the presence of the habitations of men, should be the sanctuary of health. Imagine the stream, the water-falls, the lake expansions of any one of the hundred tributaries flowing into your noble Ottawa, where through the long winter months snows of virginal purity have fallen to yield in the spring their crystal streams to the ever-green forests, over which the winds have blown for hundreds of miles, untrodden, save by the passing huntsman or lumberman, and we instinctively know that there no disease has yet been introduced, that there no infections are harboured, and there nature gives of her best and purest and without stint. All of us know this, for who amongst us has not spent at least some part of a summer holiday in these unbounded health resorts? All know the conditions, the converse of this!

Often has the picture of Prof. Teufelsdröckh, looking down from his attic at midnight over his city of Weissnichtwas as described by Carlyle, seemed to me the most dramatic and realistic picture of what he calls the phantasmagoria of human life. Says Teufelsdröckh: "It is a true sublimity to dwell here." These fringes of lamp-light struggling up through smoke and thousand-fold exhalations some fathoms into the ancient reign of night; what thinks Bootes of them as he leads his hunting dogs over the zenith, in their leash of sidereal fire? That stifled hum of midnight, when Traffic has laid down to rest; and the chariot-wheels of vanity, still rolling here and there through distant streets, are bearing her to halls roofed in, and lighted to the due pitch for her, and only vice and misery, to prowl or to moan like night-birds, are abroad; that hum, I say, like the stertorous unquiet slumber of sick Life is heard in heaven. Oh, under that hideous coverlet of vapours and putrefactions, and unimaginable gases, what a fermenting lies simmering and hid? The joyful and the sorrowful are there; men are dying there, men are born there, men are praying. On the other side of a brick partition men are cursing; and around them all is the vast wide night! The proud Grandee still lingers in his perfumed saloon, or reposes within damask curtains; wretchedness comes into truckle beds or shivers hunger-stricken into its lair of straw; in obscure cellars, Rouge-et-noir languidly emits its voice-of-destiny to haggard hungry villains; while Councillors of State sit plotting, and playing their high chess-game whereof the pawns are men! Gay mansions with supper-rooms and dancing rooms are full of light and music, and high-swelling hearts; anon, "Riot cries aloud and staggers and swaggers in his rank deed of shame; and the mother, with streaming hair, kneels over her pallid dying infant, whose cracked lips only her tears now moisten. "But I, mein Werther, sit above it all; I am alone with the stars." Perhaps! perhaps, ladies and gentlemen, it was for Teufelsdröckh, perhaps it may be for us, a true sublimity to dwell with him, sitting there above it all, alone with the stars, a correct enough attitude for a philosopher, but not, I trust you will agree with me, for men! The Divine Master looked down upon the Holy City to weep over it; thereupon he went down to the multitude and healed their sick.

Ladies and gentlemen, I have indicated as briefly as possible the several elements entering into the problem before us to-night. These are:

1st. A disease, the perennial scourge of the people.

2nd. The two laws which enter into all life, (a) The struggle for our own existence,

(b) The struggle for the existence of others.

3rd. The dependence of specific forms of disease, such as tuberculosis, which are but minute forms of life, parasitic on high beings, upon conditions of environment favorable or unfavorable for their development.

4th. The existence in the haunts of nature of an environment inimical to the spread of such a disease as tuberculosis.

5th. The presence down among men, as Teufelsdröckh looked upon them, of conditions favorable to the laws of growth and development of this scourge of our cities.

So important to the state, to the philosophy of life, to the science of biology, to the wholesomeness of nature uncontaminated, to the difficulties which beset man in his progress upwards to a higher and more complex social existence is each of these several elements in the problem that each might profitably occupy the whole time at our disposal in its discussion ; but I trust enough has been indicated to make plain to us that society, as it has evolved, as scientists tell us, from *homo alalus*—the savage with a language only of gestures and wild sounds, the denizen of caves, and perchance arboreal in his habits—to the Bedawin nomad, the shepherd with flocks and herds, thence to the man who cultivated the primal Eden, and there built the mighty cities, of that Mesopotamian land with their storied ruins, teaching us to-day of their greatness, and which the people of the continents have during the past half-century been unearthing,—has only been striving to attain to that high ideal of material progress and moral elevation, which is being foreshadowed in that Altruism, which, personified in its Divine founder, 1900 years ago, and emerging now and again in these centuries from the deep, like coral islands raised by their myriad minute builders, and like them only to be submerged again by some seismic disturbance of the social fabric, seems now to be gradually moulding society, after some regular and permanent form. We are discovering that true science is but a general term expressive of material progress, not alone of the individual, but of the nation and also of social happiness and moral and spiritual elevation.

“ For we know that through the ages an unceasing purpose runs,
And the thoughts of men are widened with the process of the suns.”

Let us examine for a brief moment what social progress means in this country, or indeed in any country ! Man with us has got beyond the stone age, though yet we have remnants of it in some of our native races. The settler goes forth, and in this new age, fells the trees and erects the rude log cabin. At a distance from him soon comes his neighbor. The local store springs up, and near it the mill, on some convenient stream. Hence a village with its smaller lots, its aggregate of individuals. The cabin large enough for two soon has its half-dozen inmates. Soil-pollution gradually increases about the dwelling, the springs become polluted by animals and men. What to the nomad was impossible, now prevails, viz., the danger of permanent settlement. The village grows into the town. Better houses, some attempts at outward adornment, street building and walks follow. Here and there the spring or well is cared for ; health is retained. But soon the diseases of aggregation, as typhoid fever, appear indoors the crowding means polluted air, aerial infection from some imported cause of disease, as diphtheria, or perchance consumption, is inevitable, and the family, indeed the very house, becomes a source of public danger. Probably the most notable fact in the development of such settlement, where the schools and churches early appear, is the relative absence of the social idea of co-operation in the matters of health, or indeed in any true sense of the word of the possibility of such. For years it has been my fortune to visit settlements in every part of the Province, and constantly have I found, that while they may be informed and instructed in all the details of some political convulsion, though they may argue with all the virulence of an *odium theologicum*,

“ Of forms of faith let priests and bigots fight,”

yet I have known no longer than last year, a rapidly progressing town of 4,000 with miles of fresh water lake laving the very shores of the town site, continuing to contentedly bail water into barrels from the polluted bay, receiving the filth of the town even ; although some fifty cases of typhoid had appeared in the town within a previous two months.

Churches, schools and opera house, even an hospital to receive their typhoid patients, and a splendid Queen's jubilee celebration, and yet such polluted water was given to their own people and to the travelling public, waterworks being only talked of.

Or I might take an example of one of the oldest, busiest, and wealthiest manufacturing towns of western Canada, where thousands of dollars were being spent on granolithic sidewalks, which had limestone rock near the surface, and the water from a stagnant mill-pond on the high ground soaked into the cellars of the main street, so that even in August barrels continued to float in them.

Or to take one of the larger and more rapidly growing cities in the eastern portion of the Province, with wealth, educational and religious institutions, and social brilliancy at their highest, a city which within the past five years has added more than 100 acres to her area, and yet which has again and again refused to vote public funds for a sewerage system, which alone will enable hundreds of houses over this area to have one of the primary requisites to good health, a dry cellar. Last year this city spent very largely on her charities, has at least half a dozen hospitals, has sweetness and light and legislation, yet spent but a few hundreds on public sanitation. In the words of the apostle, "Brethren, these things ought not so to be!" Perhaps it will be impressed upon some of the members of the National Council here to-night that there is here a field for a womans' sanitary protective association.

There is, however, another most interesting and important phase of this modern social evolution. I have pointed out that a dry cellar and well-drained house are the simplest elements entering into the healthfulness of a dwelling. They prevent dampness and decay with their associated dangerous emanations. But while in many houses the superstructures are well built and productive of health, we have in our schools and workshops conditions demanding constant and systematic supervision. We in Ontario have much to be proud of in our school system, and indeed of our school buildings. But when we realize that in the city of Ottawa the yearly natural increase of births over deaths, allowing nothing for immigrants, means the need for the erection annually of a new school building for some 300 scholars and seven additional teachers, it will be understood that a broad and intelligent policy is demanded if we are to at all adequately meet the requirements.

Not excepting the home, where the child's first years are spent, we have in the school, where six hours a day are spent, one of the most potent influences for good or evil present in our social life. Rapidly as we are overcoming these difficulties, it is nevertheless true that some 75 per cent. of all contagious diseases are contracted through the medium of schools, while the directly malign influences of the foul air, due to overcrowding, can be seen by the most unobservant who will follow the health of his child during a school term. Parenthetically it may be remarked that female school teachers of the London (England) board schools have shown a higher mortality than almost any other class between the ages of 20 and 39.

Of this class of evil is the over-crowding of workrooms and factories. Municipally, as yet, we have done almost nothing to regulate this class of evil. Here, however, competition enters in and we are told that if the employer and the employed are agreed nothing more is to be said.

In this connection we have that other question to which we have only begun to give attention, viz, the systematic inspection of our food supplies. Is anyone seeing that the milk and meat in our markets are from healthy animals? Manifestly such supplies demand careful and constant supervision.

But I do not need to push further illustrations of the complex factors which enter into the social life of man, advanced as he has from the stage of a nomad for whom nature was the sanitarian. It is very plain that with social elevation develops the necessity for and *pari passu* with it mutual co-operation. First the co-operation is within the family, then between neighbors, next it is the community, then the town, the city, the province, the nation! And now during the balance of time at our disposal I purpose to show where this essential feature touches our lives.

In this brief tracing of society from its simpler to its more complex forms, we have been able to recognize very clearly that the very process tends to produce conditions and an environment which vary in character or degree from those normal conditions in which man, as do plants and animals, resists best the forces inimical to his healthful growth and development. Gradually acclimatization goes on, but through infinite pain. Tennyson's words are most true :

"So careful of the type she seems,
So careless of the single life !"

We have something of the change of physical environment from country to city. Teufelsdröckh has pointed out how social and moral environment are equally potent in their effects. Without, however, dwelling on those influences which have caused within recent years a new word, "Neurasthenia" to be coined, we find them expressed perfectly in a condition which every person present must recognize as that of innutrition, or otherwise malnutrition. The hurried breakfast of the working girl—often, alas, after a night of insufficient sleep, for she too must have her social pleasures,—the cold lunch at dinner hour, associated with the air impurities of work-room, or in other cases of school and home, all tend inevitably to produce, with over-study in some cases, and social dissipation in many more, the one dominating condition, that of anaemia, which, indeed, in many instances in the healthy and superadded to hereditary weakness in others, makes thousands annually amongst what Professor Verneuil characterizes *les candidats de la tuberculose*. At the risk of seeming to deal with matters too technical for a popular audience, I shall attempt to make this physiological point plain, owing to its importance in dealing with the practical phase of the problem before us, by an illustration taken from the experimental method of him, the immortal Pasteur, whom his fellow-workers and all his disciples reverently call *Le Grand Maître* of biological science.

Some of my audience will know that practically the first disease shown to be due to a microbe was anthrax, a disease which annually caused many thousands of deaths in cattle and sheep in France, but which, since Pasteur discovered its vaccine, has notably decreased, with a saving to the state of 7,000,000 francs. Now, in studying this disease, Pasteur found that he was easily able by injecting a few drops of a solution in which he had grown the anthrax germ to rapidly produce fatal disease in oxen, sheep, rabbits, and guinea pigs, but that he could never produce fatal results in fowls. Greatly puzzled, he studied the germ still further, and found it was sensitive to an increased temperature, and would not grow in the blood of fowls several degrees higher than of these other animals. Now mark the beauty of the inductive method ! He immediately thought, "If I reduce the temperature of the fowl it ought to grow," and he caused a fowl inoculated with the germs of anthrax to stand in cold water so that its temperature was reduced from 42°C. to 38°C. At the end of forty-eight hours the bird was dead and its blood was found to be teeming with the microbes of anthrax. Other fowls after inoculation and similar chilling he wrapped in cotton wool and flannel where they gradually regained their normal temperature and recovered and no microbe could be found in their blood.

I trust the inference is evident. The so-called candidates for consumption, like the fowls, once perhaps normally resistant to disease, lose this in the degree that their vital powers, their richness of blood, their ability to obtain, digest, and assimilate food are reduced and lessened ; and while, should the microbe of tuberculosis not be present in their respiratory passages or stomach, they will not take consumption any more than the fowl without inoculation would not take anthrax, yet it is evident that malnutrition, temporary exhaustion, a severe chilling, or a severe sickness, as typhoid fever, all create conditions most favorable for the attack of a disease whose germs are so generally disseminated in the habitations of populous centres. To use the accurate expression of Verneuil, "The changes of environment exercise a notable influence on the development, the march, and the termination of tuberculosis. These changes operate in two ways, from the city to the country (emigration *urbi rural*) ; from the country to the city (emigration *ruri urban*). The first renders great service to the tuberculized, the second favors on the contrary the appearance or progress of tuberculosis."

Surely, ladies and gentlemen, very manifest facts are before us ! We have a disease shown to be by far the most fatal to our people ; to be a disease due to a specific germ or microbe ; to be essentially dependent for its development upon mal-nutrition, whether hereditary or acquired ; to be dependent for its development upon an environment, essentially caused by density of population, whether localized in a single house or in many houses as in a city ; and by such other conditions as by affecting nutrition and nerve force, lessen the vital resistance of the tissues to the growth and development of the disease.

I may ask, adopting a phrase from, I believe, a certain political vocabulary, "What are we going to do about it ?" Is it hopeless to attempt the solution of the problem ? Some may be inclined to say "It is the will of Allah," but the science of to-day looks upon no problem of nature as insoluble.

Fifteen years ago, Ontario had but twelve public systems of water supply and over 3,000 deaths from typhoid fever in five years ; in 1897 she had ninety systems of public water supply in her cities and towns, and but 1,600 deaths from typhoid in five years then ending. Even with the still high mortality Glasgow has seen a falling of the deaths from consumption between 1860 and 1894 of forty-four per cent, due to improved sanitation. With such facts regarding the disease in Glasgow, and still more remembering what has been done regarding typhoid in Ontario in fifteen years, I am prepared to say that given the full knowledge of the cause and conditions of the development of tuberculosis, and fifteen years will see the death rate from this disease in Ontario reduced as much as typhoid during the past fifteen. And why dare I say this ? Primarily because science has solved the problems of the cause and prevention of the disease, and secondly because society, the State, and greatest of all the National Council of women who represent the moral and intellectual will of the people of Canada, realize to-night that there is a practical means whereby early and effective aid to recovery can be brought to the many in our communities, who hitherto have been looked upon as condemned to certain death ; and at the same time such may be saved the sad consciousness that in going down to death they are likely to drag other dear ones with them. Elsewhere I have quoted statistics taken from mortality returns in England, and such as those from the New York Health Department which state that in a single crowded ward in that city in 1896, thirty-seven per cent. of the total 663 houses were infected with one or more cases of consumption, or there were .81 per cent. of cases for every house in the ward. But it comes nearer home when I state that during ten years, of the total deaths in a single old-settled county of Ontario, thirty-seven per cent. of all persons dying of consumption were names which recurred on an average two and one-half times, and the same family name in the highest instance occurred seven times in ten years.

Let these facts both of the danger and the possibility of remedy in this disease be once fully realized by our people, as they have for years understood the dangers of spreading small pox, and to-day of diphtheria, and, in spite of the chronic course of this disease and its relatively less contagiousness, can any one doubt that in the degree which the individual, the family, the municipality, and the state appreciate the preciousness and economic value of a life or the lives of its citizens, each will put forth in its place energies adequate to meet the needs of the case. If it be asked upon what is such reasoning based, I say simply from analogy based upon facts already within our knowledge.

Sixteen years ago there were no laws in Ontario for systematically dealing with contagious disease, or the control of public water supplies. To-day in the 747 municipalities there are 5,000 men appointed by law, who, nominally at any rate, and in very many cases actively, are engaged in dealing with public health matters, apart entirely from the regular physicians. During this period some \$9,000,000.00 have been spent in the construction of water works in ninety municipalities.

But further, twenty years ago there were but ten hospitals in Ontario receiving Government aid for 4,372 inmates ; in 1897 there were forty-seven hospitals and 19,372 patients receiving Government aid.

In 1880 there were two County Homes for the poor in Ontario; in 1897 there were fourteen; and where in 1880 there were twenty-three Refuges and Orphanages in the cities and towns, to-day there are forty.

Again, while in 1882 there were no contagious disease hospitals and very few separate wards for their treatment, there are to-day twenty-five contagious hospitals or separate wards in other hospitals regularly maintained for contagious diseases, while other smaller towns have buildings fitted up as temporary hospitals.

Even up to five years ago, and in some instances to-day, consumptives were treated in the general wards of our hospitals; to-day every new hospital and many of the older are preparing to place consumptives in separate wards.

Thus it will be seen that there has been a steady evolution toward the true scientific method going on in every one of these problems. The state and society have in their methods followed very closely upon the facts established by the experimental methods of science. The poor are rapidly being taken from the gaols and placed in rural Homes, and the street waifs in Industrial Schools. Small-pox, scarlet fever, and diphtheria are taken to contagious disease hospitals; and lastly, the consumptive is being placed in a separate ward. But at last and recently the next great step has been taken, and this time, as in most other cases, first by private philanthropy. As the evangelical Van der Broeck was the first to establish near Hamburg the idea of the free colony for the unemployed by his school for boys and subsequently girls, and as pastor Kräenbuhl, the evangelist of Bratenberg, through noting the difference between those mountaineers of the Swiss Alps and the degenerate and physically weak who were in the schools of Berne and Zurich, was led to place a number of these street arabs in a school in the mountains, and saw that within a few months they were metamorphosed, and so was the originator of the mountain cure for consumptives in Switzerland, so twelve years ago private philanthropy established the Trudeau Sanitarium for Consumptives in the Adirondacks of New York State, and 1897 saw the Muskoka Sanatorium for Consumptives similarly established.

Surely this *resume* of the evolution of altruism in society and of state socialism, as governmental interference in social matters is called in Germany, in Ontario, and elsewhere is enough to authorize the statement that the movement for "Homes for Consumptives" now begun will see a rapid evolution in Canada within the next fifteen years. And the reason for them is simply that the situation demands them.

It is fifteen years since a report presented by its committee to the Social Science Congress of Great Britain on "Administration of Hospitals" stated, "There is a class of illness, which, refused admission to hospitals, is unsuited to work-house infirmaries. Such diseases are consumption, hip disease, and other chronic ailments requiring a lengthened treatment, country air, and surgical appliances are almost entirely neglected. Medical relief to be complete should effectively deal with these." This statement made so many years ago has had emphasis added to it every year since, and nowhere more than by the single fact that of 430 consumptives treated in the hospitals of Ontario in 1896, twenty-three per cent. of them died in the hospital, although their average residence there was less than fifty days. In other words they went to the hospital really to die.

Clearly then if the needs of the case are proven there only remains for us to show that a remedy has been found, and that there are practical means whereby such remedy can be provided. These are:

1st. Fight by all combined energy to prevent by education of the people and by legal enactments every cause inducing ill-health and thereby consumption. What these various causes are I have already indicated.

2nd. Assist in the removal of the cases, the sources of immediate infection, at the beginning of the disease from the small and poorly equipped homes and the factories and work-rooms where our less fortunate people reside and labor.

3rd. Build in every county or district "Homes" where at the early stage of this disease, when it is essentially one of malnutrition, those suffering may go, and by correct regimen, abundance of food, of fresh air and sunshine, of exercise, rest and sleep, main-

tain the fight against the destructive forces of the disease ; where they shall have a fair chance of saving their lives to their families and to the State, and at the same time be saved the danger of infecting those whom they love.

Take but a single example of what this means in a single city. From the Toronto death returns of 291 names of persons who died in 1896 of consumption 184 were between 15 and 60 years of age, and of these 52 were returned as "housewives." To none of us is there in the misfortunes of life any occurrence which seems sadder or which appeals more to human sympathy than the loss to children of a mother's care. Sadder still is the thought that through extending this to them to the last moment of her life she in many instances has become the innocent medium of communicating the seeds of this fatal disease before she has left them.

To see such "Homes" erected then must be the object of our efforts. How have the 47 general hospitals of Ontario been established ? In almost every case by the efforts of the ladies of our cities and towns, supported by private subscriptions, and grants made by the municipal councils, supported by government aid. We have a large and most influential association called the Prisoners' Aid Association, which is ameliorating the condition of these unfortunates and getting many vagrants removed from county gaols to Houses of industry which they insist shall be established. Is the end to be attained not great enough to have, not necessarily a "Consumptive Homes Association," but the local councils of this association to make this scheme one of their chief fields of operation during the coming year. The Provincial Board of Health which I represent has for years been exerting its influence and not in vain to educate the public on the various phases of the causes and prevention of this fatal disease. It is to-day ready to aid by literature regarding desirable locations, method of construction, equipment and management, and is trusting to find allies, especially in this association, who shall bring local influence to bear in a matter which always has to have a local committee of "ways and means" in order to obtain results. I am further empowered to say that the Minister having under his charge the Provincial Department of Health is prepared to lend his influence to second in every way at his command the local efforts made for the progress of the work of establishing such "Homes."

At Christmas time in Toronto when I addressed the Local Council of Women on this subject Her Excellency promised the work her countenance and active assistance. In inviting me to speak to-night to the ladies of Canada she has indeed done more than this, for she has given me a chance to appeal to the hearts and the charitable philanthropy of the women of a whole nation. With these combined influences actively at work, seconded everywhere by the leaders of medical science in Canada, and supported by municipal and governmental aid, I already see the dream of many years fulfilled, and the greatest advance made which is possible in any field of Public medicine.

RELATIONS TO AND DUTIES OF MUNICIPAL AUTHORITIES REGARDING SANATORIA FOR CONSUMPTIVES.

An Address by P. H. Bryce, M.A., at a Public Meeting in Toronto, Dec. 12th, 1898.

MR. MAYOR, LADIES AND GENTLEMEN—Viewing the subject which is especially engaging our attention to-night from the position of a public officer, whose duty it is to study the causes of and to advocate measures for the prevention of disease, I have no hesitation in stating that in my opinion we have before us at once the most important and the most difficult problem which we as members of a complex society are required to deal with, viewed either from the social, the scientific, or the economic standpoint. We have to enquire into the manifold influences, which, year by year, cause almost one-seventh of the deaths in the population of our country and our city to result from the attacks of a single disease, manifesting itself in different forms, and to answer the question of whether we have not enough scientific knowledge of its origin and modes of progress as to be able to institute organized measures for its prevention or cure.

There has been placed in the hands of many who are present to-night a list of every death registered as due to tuberculosis which has occurred in our city during the years 1892 to 1897 inclusive, classifying these deaths by ages, sexes, and occupations; and a similar list, telling much the same story, can be made for every city in the land; and a still larger list, proportionately, for all the great cities of America and Europe.

First we observe in this list that a total of 2,290 deaths occurred, or 450 annually on an average. Of this total 404, or rather more than one-sixth occurred in the first year of life, caused by hereditary taint, unwholesome or tuberculized milk, infection from tuberculized mothers, and infected houses. Other 333 deaths occurred between one and fifteen years of age. The rest, 1,553 or more than two-thirds of the whole, occurred above this age; and nearly all, 1,421, between the ages of fifteen and sixty, or during the active wage-earning period of life, when lives are worth most to the State and their families. Indeed, were we able to exterminate this disease, we would save one-third of the deaths from all causes during this period, since comparative statistics tell us that consumption causes 37 per cent. of all deaths in the cities of the temperate climates of America and Europe between these years.

Second we further find that of the 1,553 deaths over 15 years, 191 occurred between 15 and 20; 256 between 20 and 25; 271 between 25 and 30; 214 between 30 and 35; 182 between 35 and 40, and 97 between 40 and 45. That is, 1,211 persons died during the years, when if married they would be rearing families.

Third, examining the list as to occupations we find 221 registered as housewives, of whom 168 were between the ages of 15 and 45, or 75 per cent. belong to the child-bearing period. Assuming all to have been mothers, they must have left behind them families of children averaging two at least in number, all young, many indeed being babes. To this list we have to add almost as many more in the list of those whose occupation is not given, or some 80 young families are left motherless every year in Toronto from this disease. A similar number of young families are left fatherless every year to swell the unfortunate number.

Fourth. If we investigate the table yet more closely and examine the occupations, we will find that at least 80 per cent. or four-fifths belong to our artizan and laboring, or wage-earning, class. Need I say what follows when the bread-winner ceases work and becomes a care instead of a help in a family? And what of the family when he or she is gone?

Fifth. Turning to the tables found in the government reports, we find a partial answer to these questions. In Toronto we have 8 orphanages, so classed in the reports. In 1897 these together had in residence 847 children at the beginning of the year, and during the year had let the most of them go for adoption or elsewhere, I know not where, but 812 more were admitted. Two regiments, each 400 strong, then are annually marched to our orphanages, most of them the indirect victims of this disease. Surely we have absolute proof in this that the disease reduces to the extremes of poverty our honest and industrious working classes

Sixth. But what more do we find in these tell-tale government blue-books? This, viz:—that 19,617 persons were inmates of Provincial hospitals in 1897, or 2,100 more than in 1896, and of these 6,009 were in Toronto, the increase being 517. Were any of these consumptives, who, no longer able to be maintained at home, were sent to the hospitals at least to die in comfortable surroundings? This is what the reports tell us: viz., that in the five hospitals of the city some 369 cases of tuberculosis of the lungs and other organs were treated in 1897. With regard to the total diseases treated in the out-patient departments of our hospitals, I find it difficult to obtain the complete figures, but so far as I have received them they are as follows:—General Hospital 14,549, Sick Children's Hospital 3,366, St. Michael's Hospital 6,789.

I am only, ladies and gentlemen, in the brief time at my disposal, dealing with figures which are available to every one of you. The large-hearted philanthropy of the citizens of Toronto, of her municipal government, which between charities and health department spends \$90,000.00 annually, and of the Province of Ontario which spent last year

in Toronto \$42,998.60 make our own hospitals what they are, and have long been, our glory, and to our credit as a city. But need I ask you whether it has been wise philanthropy and good economics which have saved in 1897 as compared with 1891, 230 lives from scarlatina, diphtheria, measles and whooping cough and from small-pox? Have we not these sturdy, growing children—our future wage-earners—saved to us, and homes made happy by their laughter? If you agree with me in this, then a hundred times more must you agree with me that we must apply our energies, our time and our money to saving three times the number of lives of all those who died of these several diseases, from a disease which robs us of 300 wage-earners annually, makes us support 800 orphans, and sends hundreds into our hospitals, to die at least in decent surroundings.

Could we on the New Year's Day of 1899, give a home to the thousand persons at least, who at the present moment are tuberculized and living in Toronto; give to the many in the initial stages of this disease, a chance of life by sunshine, food, rest or regulated exercise, and we would find a year hence our list of able workmen increased by several hundreds, over two battalions of orphaned children reduced by one-half, the inmates of our hospitals and homes lessened, and our general happiness and prosperity notably increased.

It simply means transferring our energies and our funds to preventing what in all these several ways we are endeavoring at an enormous cost to ameliorate. I ask you, ladies and gentlemen, in the name of our suffering fellow citizens, in the interests of our national well-being, in order to enlarge the knowledge and power of science to prevent disease, and from the standpoint of ordinary prudence and common sense to take the first step to this end by establishing a citizens' sanatorium to cure consumption, and by removing the infected from the houses of our poorer people to prevent further spread of the disease.

But some one asks, is such saving of life possible? Can consumption be cured? Our answer is, such saving of life is possible. Consumption can be cured. But at what stage? I answer at the same stage when so many of our other severe, contagious diseases are curable, viz.: in its initial stage, early in the onset of the disease. Abundant statistics are available to prove that this is true. Dr. Weicker of Gorbardsdorf, of one of the oldest and largest sanatoria in Germany, states in his latest statistics that there have been eighty per cent. of established cures amongst the poorer class of patients sent by government insurance societies, with an average stay of but sixty-seven and one-half days. This marvellous result is due to the fact that these societies send patients at the earliest possible date. But taking the results of the Adirondack Sanitarium in New York State, now established thirteen years, for 1896 I find that 177 patients were in residence for various periods. Of the eighty-nine patients who remained from three to twenty-five months, or an average of eleven months and ten days, eighteen were incipient cases, of which fifteen were apparent cures, and three had the disease arrested; forty-five were advanced cases, of which five were apparent cures, and ten had the disease arrested; twenty-five were far advanced cases, of which none were apparent cures, and seven had the disease arrested. Thus the point of greatest interest is that, of the eighteen incipient cases, eighty-four per cent. left cured.

But the life-saving is especially to be recognized in the fact that these were sent for cure at a period in the disease before they were a serious menace to the health of their families. Statistics innumerable might be quoted of whole families swept away by this disease, but many present are familiar with several so recent illustrations in our own city that further illustration is not necessary.

Ladies and gentlemen, we have as fellow-citizens a present, urgent, imperious task laid upon us of lessening the misfortunes and sufferings of our working people, increasing the general happiness and prosperity, and removing serious danger to ourselves. Shall we not perform it?

PRACTICAL RELATIONS OF STATE HEALTH AUTHORITIES WITH RAILWAYS AND OTHER PUBLIC CARRIERS IN THE MATTER OF THE TRANSPORTATION OF CORPSES.

By P. H. Bryce, M.A.; M.D., Secretary Provincial Board of Health.

TORONTO, July 10th, 1898

Mr. President and Members of the Association of National Railway Surgeons of America :

GENTLEMEN :—In dealing with the subject upon which I have been asked to prepare a paper, it is necessary that we recognize several conditions which during the past twenty-five years have changed in the matter of the transportation of the dead, and which affect very materially the relations of public health authorities to this matter. The first of these is the enormous development in the facilities to transmit freight and express parcels of all kinds by rail, both as regards time and expense. 2nd. The well-determined cause of the origin of the principal contagious diseases, and of their methods of dissemination, and 3rd. The development along with such knowledge of the scientific means whereby the infectiousness of such diseases may be wholly or in a great part limited. Formerly the limited amount of travel between different sections of the country, the time and expense involved therein, necessarily made the number of persons dying away from home less than at the present time ; and the question of their transportation home, owing to these several reasons was a matter which would only occasionally be discussed. To illustrate how common the transportation of the dead has become at the present time, I give sub-joined the returns supplied me by the kindness of Mr. Quick, the General Freight Agent the Grand Trunk Railway: viz., of corpses shipped per G.T.R. May (1898) 151, and June, 95. With such every day facts before us, it is evident that the social sentiment of our American communities tends to conform with the old idea, that members of families dying abroad, should be buried at home. As regards the transportation of bodies dead from contagious disease which necessarily becomes a question with which health authorities everywhere have to deal, it is apparent that the facts known for so long a time that contagion spreads from such bodies, necessitated the absolute prohibition of their transportation as the only means formerly known whereby public interests in matters of health could be considered. This may said to be simply an illustration of what was formerly known as a "shot gun" quarantine in dealing with outbreaks of small-pox, cholera and other similar contagious diseases. To-day, however, it may be said that as in all States and Provinces where State medicine has become developed, these old methods have largely given way to a more intelligent and effective scientific quarantine, so in the matter of the transportation of the dead, we now must recognize the ready limitation of the spread of such diseases by the use of simple, yet thoroughly scientific measures, and the only question which would seem to remain for our consideration, whether as State Officers, Municipal Officers or Railway Surgeons, is, what practical organization is available for putting such methods into effect. There are three factors necessary for the solution of this problem, state and municipal regulations with authority and machinery for their proper execution, railways willing and prepared to carry out their share of the work, and the undertaker or person representing the individual of the community whose duty and desire is to see that his dead are buried, both in conformity with his wishes and the regulations of the State. In practice it may be said that no machinery, theoretically perfect in regard to dealing with contagious diseases, has always proved equal to the work to be done. To-day in several States, possibly in one or two States, the undertaker or embalmer is licensed, and by such license is assumed to be trained in all modern scientific methods for preparing dead bodies for transportation without danger to the public, and to be of such good standing in the community that it may in this particular trust its health to his care. For instance, the City of Chicago has licensed embalmers, divided, I believe, into grades, and upon these individuals the Health Department depends, along with the physician who has attended a patient who has died, for the safe carrying out of regulations, for the safe transportation of contagious disease. The following two communications illustrate what may happen occasionally, though perhaps not frequently as a result of dependence on such persons.

A letter of Dr. Sheard, M.H.O., Toronto, regarding scarlatina brought from Chicago.

TORONTO, April 12th, 1898.

Dr. Peter H. Bryce, Secretary Provincial Board of Health.

DEAR DOCTOR,—We have had a case of Scarlet Fever reported No. 53 Borden St., in the family of one Crompton. My Inspector on looking into the matter informs me that Alice D. Crompton, 3 years of age, came from Chicago on April 7th, and on April 9th was taken with Scarlet Fever and removed to the Isolation Hospital.

On March 24th, Guy and Marion Crompton were down with Scarlet Fever in Chicago, and attended by one Dr. Porter. Guy Crompton died on April 5th, and a certificate was given by Dr. Porter, of "Heart Failure." The body was brought on from Chicago and interred in Toronto on the 7th April. Marion Crompton is at present in Chicago and ill with Scarlet Fever. The Inspector was informed by the Cromptons that Dr. Porter gave them permission to come to Toronto.

In view of the trouble which we had with Scarlet Fever in the City of Toronto last summer, and the extreme liability to the spread of the infection, I think these facts ought to be presented to the Health Commissioner of Chicago, and with that object in view take the liberty of writing you in reference thereto.

Faithfully yours,

(Sgd.) CHARLES SHEARD, M.D.,
Medical Health Officer.

Dr. Bryce's letter to Dr. Reynolds, health officer, of Chicago :

TORONTO, April 13th, 1898.

Dr. Reynolds, Commissioner of Health, Chicago, Ill. :

DEAR DOCTOR,—I send you a copy of a letter I have received from Dr. Sheard, Medical Health Officer, of Toronto, regarding the appearance of scarlet fever, in a family reported as recently having come from Chicago. The cause of the transportation is apparent in the report of the physician, which gives "heart failure" as the cause of death. I shall be greatly obliged if you will have the facts enquired into, as to whether the child, Guy Crompton, who died April 5th, had been reported to your department as a case of scarlet fever. As you are aware, a representative of the State Board of Illinois attended the conference at Cleveland last June, where we were discussing the transportation of corpses by rail, and while the general feeling was that we wished to encourage transportation under proper supervision, it is clear that we must have such dependence on our undertakers that they will not be guilty of such violations of the law as that reported by Dr. Sheard.

Your obedient servant,

(Sgd.) PETER H. BRYCE,
Secretary Provincial Board of Health.

Dr. Reynold's reply :

CHICAGO, April, 1898.

P. H. Bryce, M.D., Secretary Provincial Board of Health, Toronto, Ont. :

DEAR DOCTOR,—Your letter of the 13th inst., with an enclosure from Dr. Sheard with reference to the fact that Alice D. Crompton, three years of age, was taken with scarlet fever on her arrival at Toronto from this city, and the fact that the body of Guy Crompton was shipped to Toronto with a shipping permit showing the cause of death to be "heart failure," when in fact it was scarlet fever, is received.

Enclosed you will find copy of the death certificate filed in this office, which shows that the death was from scarlet fever, heart failure a contributing cause. You will also find a copy of the report of Dr. Gunn, Inspector of Funerals, and a report from Jas. J. Dillon, the Recorder of Deaths. From these reports it is evident that the body was properly prepared, and the cause of death given was scarlet fever and not heart failure. We must, of course, admit that Alice Crompton should not have been allowed to travel from a home where scarlet fever existed. I have not yet heard the full particulars from Dr. Porter, but an investigation is in progress, and he will be dealt with if we find he sanctioned the trip.

It is our custom to permit the attending physician, where he assumes to prevent the spread of a contagious disease, to have charge of the case. As a rule it works admirably. At present, however, it looks as though Dr. Porter had rather betrayed the confidence reposed in him.

I thank you very much for the information contained in your communication, and I am very glad to see that my native Province is taking such excellent care of the health of its citizens.

Kindly commend me to Dr. Sheard, and believe me,

Very truly yours,

(Sgd.) ARTHUR R. REYNOLDS, M.D.,
Commissioner of Health.

Dr. Bryce's reply to Dr. Reynold's letter :

TORONTO, May 3rd, 1898,

To Arthur R. Reynolds, Comm. of Health, Department of Health, Chicago Ill. :

DEAR DOCTOR,—I have to thank you very much for your letter of the 18th ult., regarding this matter. I have sent Dr. Sheard a copy of your letter, and trust that the matter has been satisfactorily explained.

Yours very truly,

(Sgd.) PETER H. BRYCE,
Secretary.

It will be quite apparent from this illustration that health authorities in granting that modern methods for the transportation of persons dead from infectious diseases are sufficient to protect the public health, and assuming that the persons, whose municipal authorities permit them to do this work of the preparation of the dead may be depended upon, must recognize that local conditions are much too varied for absolute trust to be placed in the thoroughness of the knowledge and work of undertakers taken as a class. Notwithstanding this fact, the public health authorities of different States and Provinces on the continent have by reports adopted at different meetings, recognized that the resolutions which were the outgrowth of the Conference held in Cleveland in June, 1897, between State Officers of health, Railway authorities and representatives of the Undertakers' Association are, if properly carried out, adequate in their judgment to the protection of the public health and for complying with the deep-seated social sentiment already alluded to.

For the convenience of members of the Association who may not have seen these regulations, I include them herewith. I may say that these regulations have, so far as Ontario is concerned, been approved of by the Provincial Board of Health, and only await the approval of the Lieutenant-Governor and his Executive in order to become law.

In the report of the Provincial Board of Health, which adopts these regulations, there is however, a very definite line of action deemed necessary for their proper execution. The report states :

(a) With a view to giving effect to these regulations, your committee has attempted to give practical expression to the views of your Board as expressed at the last meeting. In order to insure proper care and preparation of the bodies of the dead, prior to transportation, it is proposed that for the purposes of these regulations, the seventeen divisions into which the Province of Ontario is divided, for returning representatives to the Ontario Medical Council, be adopted, as the units for which one or more certified persons may be appointed to carry out the foregoing regulations of the Provincial Board.

(b) In order that persons certified may be fully qualified to carry out the regulations, your committee would suggest that examiners nominated by your Board be appointed, before whom candidates shall be notified to appear from the several divisions, and that in accordance with their standing on examination, they shall receive a certificate of qualification.

(c) In order that the greatest control may be practised in cases of dead bodies prepared for transportation, it is recommended that there be but one person named in each of the seventeen districts, who would be a resident in the district.

(d) In order that the matter may be properly regulated as regards expense, the Board would prepare a schedule in which would be included the cost of the travelling expenses, and of the preparation of the body for transportation ; while at the same time a provision would be inserted in the regulations governing the appointment, whereby a disputed account could be taxed in the matter of costs

(e) It would further be necessary to provide that a certified appointee could engage in work beyond his own electoral division only at the request of the appointee for such latter district, or in the case of the sickness or death of any appointee or in other emergency, the power to allow the passing from one district to another might rest with the Secretary of this Board. The latter methods to be alluded to by me further, with regard to the subject I present to you for discussion. To-day, practically no bodies dead of contagious disease, are transported by the railways of either the United States or Canada, and it must be apparent to the six hundred members of this Association, that where some 60 States and Provinces have a common railway system, where thousands of municipalities with their officials exist in these different States and Provinces, and where hundreds of railways exist under different management, that the State officer if he admits the practical possibility of transporting persons dead of contagious disease without endangering the public health within his jurisdiction, has to feel that there is behind him a common organization which is prepared to protect his public against the many possible accidents, which such diverse communities and interests involve. It may appear to the members of

this Association, that the time has practically arrived when such an association of trained scientific gentlemen exists, upon whom such a State officer can confide, viz.:—The Association of National Railway Surgeons, whose interests, it may be said, are those of the Companies they represent; but it might be that such gentlemen would at times fail to conform to regulations which might be detrimental to the temporary interests of their Company. I recognize on the other hand, however, by virtue of the scientific status of the members of this Association that they will require State officers to recognize that the best interests of the railways are consulted by the closest conformity to a system of regulations which ought certainly to be uniform in practice.

What can the members of this Association do to assist public health officers in this matter? I would say by advocating in those communities and States from which they come, by their most earnest efforts, the appointment of a number of expert and scientific members of the medical profession who shall be responsible to the state authorities for supervising the preparation in every case of the bodies of those dead of contagious diseases within their jurisdiction both within and beyond state boundaries, for transportation. There need not be many such, since it has been estimated that out of one thousand deaths in Ontario, dead of contagious disease, probably not more than 50 would die away from home. If such officers could be called upon by the undertaker in charge of the arrangements for a funeral, they would proceed to such point within their jurisdiction, supervise the preparation for transportation, and forward as is provided in the proposed Act and Regulations, a copy of the Transit Permit made in duplicate, to the central Health Officer of the State. By this simple method it appears that such regular control of the transportation of the dead over the whole continent becomes possible, since it will make it a simple matter to trace any unfortunate results growing out of any particular case immediately back to the responsible party.

I trust that this Association will give to this subject, not only such discussion as its importance deserves, but will by resolution and in such other way as it can, aid in bringing into practical effect, a work in which the Companies they represent are so greatly interested from the financial standpoint in the community they live in, and still more greatly interested from the public health standpoint.

REPORT ON THE IROQUOIS WATER WORKS.

April 19th, 1898.

By P. H. Bryce, M.D., Secretary Provincial Board of Health.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—In consequence of the information contained in the correspondence herewith submitted between Dr. Harkness, Chairman of the Iroquois High School Board, and your Secretary, and of the results of the analyses of samples of water being supplied at the time thereof to the villagers of Iroquois by the Iroquois Water Company, your Secretary visited Iroquois on March 18th, and with the representatives of the Council and of the Local Board of Health investigated the whole question, and discussed the difficulties which have been thrown in the way of the Company, and the best means of having the pipe extended to the St. Lawrence River, so that a good and safe supply of water might be insured.

The diagram herewith submitted exactly represents the position of the river, the old and the new canals, and the waterworks, and also shows the alternate proposals for extending the water pipe into the clear river water.

At a meeting presided over by Dr. Stevenson, the Reeve, at which your Secretary met the members of the Local Board of Health and several members of the Village Council, the necessity for prompt action was pointed out, the main facts of the case being,

1st. That the water pipe of the public service has for some eight months had its intake in the canal, close to the present pumping house.

2nd. That the canal water as seen by the analysis, when it was covered with ice and was receiving no surface wash, showed an abnormal excess of organic matter doubtless from the shores and bottom.

3rd. That with the onset of Spring the canal has become a reservoir for the surface wash of the country along its route for several miles from Cardinal to Iroquois, and is polluted also by whatever local sewage flows in at Cardinal, and the very notable amount of wastes from the large starch works at that place.

4th. That the water was excessively filthy with mud at the time of the visit of your Secretary, and was beginning to be affected by the pollution incidental to the presence of hundreds of men and teams along the canal banks.

5th. That to this menacing pollution will shortly be added the effects of the mud stirred up by the wheels and screws of steamers going through the canal.

6th. That as the waters grow warm, the pollution will cause bacterial life to multiply rapidly, and should disease germs be present in such filthy water, there will inevitably be a serious outbreak of disease resulting therefrom amongst the users of the canal water.

7th. That the Water Company has, by the terms of its contract, to supply the village with a pure water for domestic purposes.

8th. That the works were established in 1885, without the plans being submitted to the Provincial Board of Health; and further, that the alteration in the source of supply made last year, of which the Provincial Board should have been notified,—in accordance with the Amendments of 1895 to the Public Health Act,—was not referred for approval.

9th. That the Local Board of Health of Iroquois has passed the following resolution, requesting the Village Council to take such action as will insure a safe public water supply.

“Moved by A. E. Averell, seconded by W. J. Marsh, that owing to the impure condition of the water supplied to Iroquois, by the Iroquois Water Co., the Council of Iroquois be requested to take the necessary steps for procuring a supply of pure water from the said Company as soon as possible, and that the Secretary forward a copy of this motion to the Council Board.”

In view of the statements above recited, it is in the opinion of your Secretary urgent,

1st. That the Village Council, of the Village of Iroquois, take such steps as shall cause at once the extension of the intake pipe to the pure waters of the St. Lawrence.

2nd. That in view of this urgency, the Local Board of Health of the Village of Iroquois be instructed to at once give formal notice, based upon this report, to the Water Company, requiring it to abate nuisances and remove unsanitary conditions, as the Board is empowered to do under the Public Health Act,—being Cap. 248, R.S.O. 1897,—and to supply, within a definite, reasonable period, the village with a safe public water supply as required under the Act.

3rd. That the Local Board of Health be notified, in case action is not taken by it to have this danger to the public health removed within a reasonable period, that your Secretary be instructed to have such legal steps taken under the Public Health Act to have the unsanitary conditions above referred to removed, as may may be found necessary in the public interests.

In conclusion your Secretary would suggest that a copy of this report if adopted be filed with the Minister of the Department, one copy be forwarded to the Village Council of Iroquois, one to the Local Board of Health of Iroquois, and one to the Iroquois Water Works Company.

REPORT OF THE COMMITTEE ON SEWERAGE OF THE PROVINCIAL
BOARD OF HEALTH ON THE POLLUTION OF THE RIVER AVON
BY THE SEWAGE OF THE CITY OF STRATFORD,
WITH SUPPLEMENTARY REPORT.

Ottawa, Sept. 28th, 1898.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—Your Special Committee appointed to investigate the pollution of the River Avon by the Stratford sewage begs leave to report that they visited Stratford on Sept. 16th and held an investigation enquiring into the matter, taking the sworn evidence of all parties appearing before them as witnesses by complainants for the Township of Downie, and also the evidence of the City Engineer of Stratford, who was called by your committee. The evidence of the City Medical Health Officer was also taken. The City of Stratford brought no evidence to show that the stream was not polluted, while the minutes of the meetings of the Township Local Board of Health for the eleven years past were put in as evidence to show that not only had the township health authorities protested against the continual pollution of the stream, but also that the Secretary of the Local Board of Health of Stratford had been present at a meeting of the Local Board of Health of Downie Township, in 1897, when a conference took place regarding the problem.

From the minutes and correspondence of the Local Board of Health of Downie Township it is clear that the protests regarding the pollution of the river have been continuous from 1887 to the present year, such correspondence being confirmed by copies of letters in the office of the Provincial Board of Health, notably that of Feb. 17th, 1898, by the Chairman and Secretary of the Downie Township Local Board of Health protesting against the extension of the City of Stratford sewers and the continued further pollution of the river, and several references in the annual reports of the Local Board of Health of Downie Township to the continued pollution by Stratford sewers of the waters of the Avon.

Further, as will be gathered from the correspondence which is found in the office of the Provincial Board of Health from Feb. 10th, 1896, to April 19th, 1898, the Provincial Board of Health is aware that the City of Stratford had asked for that Board's approval of its sewerage extension scheme, which, as will be seen by the correspondence of Feb. 13th, 1896, was given subject to the provisos found in the following resolution which appears in the minutes of the Provincial Board :—

FEBY. 13th, 1896.

The Committee on Sewerage submitted the following recommendations with regard to the proposed extension of the Stratford sewerage system. "That the construction of the proposed extension be approved, subject to the following conditions :—1st. That the main outfall sewer be changed according to the plans submitted. 2nd. That the extension of the system be on the plans proposed, one for carrying sink water, cellar water, house sewage and roof water. 3rd. That flushing tanks be a part of the system, to be placed in proper positions. 4th. That the provisions re storm water overflows into creek be approved of whenever the Engineer's report thereon shall satisfy the Board as to the efficient character of these storm overflows, the plans for which shall be submitted for approval to the Board. 5th. That the present method of disposal be permitted during the period necessary for the construction of the main line of trunk sewer to be completed during 1896. 6th. That during this period the City Council shall have decided upon some method for purification of the town sewage which shall be satisfactory to this Board, and that the construction of such filtration plant be proceeded with thereafter at the earliest possible period. 7th. That in connection with this extension a plumbing by-law to be adopted by the City Council after approval by the Provincial Board of Health."

In addition to this indirect evidence which is in the hands of your committee, there is the large mass of direct evidence herewith submitted by the residents along the Avon and others who have known it for years to show that the stream is a polluted stream.

With regard to the sources of pollution, the complainants produced witnesses to show that the County of Perth Court House and Gaol, the Collegiate Institute, the woollen mills of E. F. Dufton, were all directly polluting the River Avon by sewers carried from them

to the stream. The statements of the witnesses will be found in the evidence hereto attached. Further, the evidence of W. F. VanBuskirk, City Engineer, of Stratford, shows that during the past eight or nine years some 5 or 6 miles of new sewers, designed for sanitary sewers, have been constructed, though as yet used largely for cellar drainage. Further, that there is no available evidence to show that such are not used for draining privies and sink water, while there has been a gradual increase of house sewers. Further, the Engineer states that the G. T. R. shops discharge water into a tile drain emptying on St. Patrick Street by an old box drain into Romeo creek. Whether or not sewage enters the drain, it discharges as dirty water into the creek. He further stated that he was aware of sewers constructed by the city emptying into Romeo or Shakespeare Creeks, as that on Gore Street and St. David Street. In answer to further questions he stated that redress for Downie Township would mean not only the construction of sewage disposal works, but also enforcing connection between house and sewer of house drain now emptying into creeks.

From the correspondence and from the evidence of witnesses forming a part of this report, it is plain to your committee that the sewage from the City of Stratford, whether from the city sewers, the county buildings, the Collegiate Institute, Dufton's mills, or from private houses is discharged into the River Avon either directly or indirectly; and that, while there was no evidence produced to show that disease had been traced directly to this pollution, there is evidence which shows that cattle pasturing along the stream drink polluted water, which from inferences based upon the experience of those engaged in cheese-making, your committee believes must affect injuriously the quality of the milk products from such cattle.

To sum up the results of the investigation your Committee would say:

1st. That the report of the Committee of the Provincial Board of Health, dated June 8th, 1886, points out that taking the estimated consumption of water of the city of Stratford at 250,000 gallons, and calculating the flow of the Avon at between 5,000,000 and 6,000,000 gallons the sewage would form about 5 per cent. of the total flow. Evidence submitted shows that the consumption of water in August, 1898, was 659,596 gallons daily. Said report which was adopted points out that the pouring of sewage into the Avon must be considered as but temporary, and that the city must be prepared to erect purification works whenever called upon by the Provincial Board of Health to do so.

2. That the evidence from the minutes of the Local Board of Health of Downie Township from October 1st, 1887, to February 15th, 1896, shows that the pollution of the Avon has been recognized as an evil which existed and which would increase naturally.

3rd. That the correspondence and minutes of the Provincial Board of Health show that for the past several years the necessity for purification of the sewage of the city of Stratford had been realized by it, and that it had laid down as a condition of the sewer extensions by the city that satisfactory sewage disposal works were to be determined upon by the City Council and submitted to it by the end of 1896, and that the Provincial Board of Health did in August, 1897, approve of the Engineer's scheme for sewage disposal by precipitation and filtration, and that the plans and details of such a scheme as modified by the engineer were submitted to the Provincial Board on April 19th, 1898, and after examination were finally approved of.

4th. That the sworn evidence of the City Engineer shows that such plans, while under consideration by the City Council of Stratford, have not been finally adopted, and that before such works can proceed the plans must be adopted by the Council and a money by-law voted upon by the people.

5th. That in the opinion of your Committee the Provincial Board of Health should intimate to the Council of the City of Stratford that, as provided under section 30, chapter 248, R. S. O., 1897, the Provincial Board does require in the interests of the public health, and notably those of the residents of Downie Township, the disposal of the sewage of the City of Stratford by sewage purification works, by such plans as have

been submitted to and approved by it, and that there seems no valid reason for delay on the part of the City Council, or any unreasonableness on the part of any person or persons, or municipality affected by the pollution by sewage of the river Avon, in seeking such legal remedy as is provided under the Public Health Act in Section 73, Cap. 248, R. S. O., 1897, for removing the unsanitary conditions created.

All of which is respectfully submitted,

(Signed). J. D. MACDONALD, }
P. H. BRYCE, } Committee.
E. E. KITCHEN.

Supplementary Report of the Committee of the Provincial Board of Health on the Pollution of the River Avon by the Sewage of the City of Stratford.

Nov. 30th, 1898.

MR. CHAIRMAN AND GENTLEMEN,—Your Special Committee begs to submit a brief Supplementary Report in addition to the Report adopted by the Board on September 27th, 1898, re the pollution of the River Avon by the sewage of the City of Stratford.

The report of the Board's Committee then adopted contained five distinct conclusions based upon the evidence, each of which went to show pollution of the River Avon by the sewage of the City of Stratford. The Committee did not deem it necessary to mention specific instances of pollution in its conclusions, such as those of the County Buildings, the Collegiate Institute, or Dufton's Woollen Mills, since they all pollute the Avon within the corporation limits, and on page 3 of the Report are shown to be sources of pollution.

Inasmuch, however, as in the application made by the Downie Township Local Board of Health, these latter, as special sources of pollution, are asked to be investigated; and whereas it has been brought to the attention of your Board by the Solicitor for the Local Board of Health of Downie Township, that the recommendation of your Committee contained in its fifth conclusion is that your Board do instruct the City Council of Stratford to provide sewage disposal works, as your Board is empowered to do under section 30, sub-sec. 4, Cap. 248, R. S. O., 1897; and whereas it is the desire of the Local Board of Health of the Township of Downie, as stated in the correspondence, to make application to the High Court, as provided under section. 73, cap. 248, R. S. O., 1897 :—

Therefore, your Committee would recommend that the conclusions contained in the Report adopted by your Board September 27th, 1898, be supplemented by the following as section sixth :

6th. Your Committee does, therefore, advise that the Provincial Board of Health do recommend the removal or abatement of the nuisances or things hereinbefore referred to, to wit :—the pollution of the River Avon by the Corporation of the City of Stratford, the pollution of the River Avon by those responsible for sewage pollution from the County Buildings, from the Collegiate Institute, and from Dufton's Woollen Mills.

All of which is respectfully submitted.

J. D. MACDONALD,
PETER H. BRYOE,
E. E. KITCHEN.

MINUTES OF EVIDENCE TAKEN BY A COMMITTEE OF THE PROVINCIAL
BOARD OF HEALTH RE. THE POLLUTION OF THE RIVER AVON,

By the Secretary of the Committee.

Stratford, Sept. 16th, 1898.

The committee met at 2 p.m., when Dr. McDonald, chairman of the Provincial Board of Health, presented the reasons for holding the investigation.

Ex-Judge Woods for the township of Downie presented the reasons why the township authorities have made the demands for an investigation. He presented the township's efforts since 1886 to have the matter dealt with.

The map of the city was shown, Romeo Ward Creek being presented as a chief source of complaint.

R. R. LANG, City Clerk, (sworn):

Q.—Have you any documents in your possession in connection with these matters? A.—I have in my possession the minutes of the Council from the beginning, but the other documents, except several from Dr. P. H. Bryce, have been destroyed.

Q.—Is there anything in the minutes of April 3rd, 1897, or thereabouts regarding communication with the Local Board of Health of Downie Township? A.—A communication had been sent by the Downie Board of Health, but no minute of any action taken by the Council is found in the minutes.

Q.—Do you remember a meeting of the Downie Local Board of Health in October, 1897, at which you gave evidence? A.—Mr. Galbraith was sent to inspect the proposed system. He approved of the proposed system, but as yet no change had taken place since 1884. Think the shoddy and woollen mill has a good deal to do with the discoloring of the water. The mill referred to is Duffton's mill. I have no doubt the evidence is correct, although I have no recollection of the incident.

(Signed) R. R. LANG.

Mr. Wood presented a map showing the course of the river.

MR. W. DAVIDSON, County Clerk, (sworn):

Q.—When was the Court House built? A.—The Court House was commenced in May, 1885, completed in 1887.

Q.—Are there closets and urinals in the building? A.—Yes.

Q.—Do they drain into the Avon without any attempt at precipitation of the sewage? A.—Yes; and until a month or so ago we had no complaints regarding such pollution.

Q.—Is the communication dated August 1st, 1898, the complaint referred to? A.—Yes: although there is another subsequent notice which the solicitor, Mr. MacPherson, has.

Q.—Does the House of Refuge empty its sewage directly into the Avon? A.—No; it does empty into the city sewer.

Q.—Do you know where the city sewer empties? A.—It empties into a small stream which empties into the Avon.

Q.—Is there any process of purification before it empties into the stream? A.—None, except exposure to the air a few rods.

Q.—The stream into which the sewer empties is within the limits of the City of Stratford? A.—Yes, but enters the Avon some distance from the township. This stream is not always running above the sewer, but is below.

By Mr. McPherson:

Q.—What is the difference between where the Court House drain empties into the river and the limits of the Township of Downie? A.—I would say about a mile and a quarter, it being a circuitous course.

Q.—Would you say that in your opinion the fact of there being closets in the Court House would create a nuisance in the Township of Downie? A.—No; I would think not at ordinary times, although during the court there are many more persons using the building.

By the Chairman:

Q.—How many? A.—Seventy jurors say for four days during four jury courts. The other courts are in session in December and June, the division courts monthly.

Q.—How many years were you mayor of Stratford since 1887? A.—Two years. I may further state that the sewer goes directly to the river as the County Council has been waiting for the construction of the city sewer, otherwise we would have put in a cesspool.

(Signed) WM. DAVIDSON.

ALEX. W. FISHER, (sworn):

Q.—What is your occupation? A.—Reporter on the *Stratford Beacon*, and have with me which I produce copy of the *Stratford Beacon* of January 31st, 1887. Mr. Fisher read from the inaugural address of the mayor, Mr. C. I. Macgregor, in which the mayor referred to the subject of sewerage, that nothing had been done toward the construction of the main sewer, now that the county buildings are near completion, his idea being that the main sewer empty into the Avon near the cemetery.

Extract was read from the minutes of the City Council dated April 8th, 1887, stating that the Local Board of Health of Downie protested against the carrying of the city sewage into the Avon.

(Signed) A. W. FISHER.

PETER SMITH, Secretary Downie Local Board of Health, (sworn):

Q.—What is your occupation? A.—I have been secretary of the Local Board of Health of Downie Township since 1885, when the Board was first organized.

Q.—How long have you resided in the Township of Downie? A.—I have resided in the township since 1867, some two and one-half miles from the river.

Q.—Have you any records of the Board relating to the pollution of the Avon? A.—Yes, minutes of meeting of March 30th, 1887, referring to Mayor Macgregor's address where it is proposed to empty the sewage of Stratford into the River Avon. After the subject was discussed the secretary was instructed to send to the mayor and aldermen, and a copy to the "*Beacon*" and "*Times*," notice that the Board will consider such action detrimental to the health of the inhabitants of the Township of Downie, and would strongly urge upon the City Council to adopt some other plan, as this Board will resist any attempt of such plan of sewerage.

Q.—Are there minutes of other meetings dealing with the matter, and if so can you supply the Committee with copies? A.—Yes; I shall do so, and with the following:—

Oct 1st, 1887.

March 3rd, 1888, (extract from report to Provincial Board of Health,) adopted by the Local Board of Health.

Sept. 28th, 1889 (extract from report to Provincial Board of Health,) adopted by Local Board of Health.

Oct. 29th, 1892 (extract from report to Provincial Board of Health).

March 16th, 1895 Minutes. These minutes were communicated to the City Council.

Feb'y 15th, 1895. The matter was discussed and a letter was sent to the Provincial Board of Health.

Q.—Have you received any communication from the City Council acknowledging receipt of communications? A.—None.

Q.—Did you cause the city to be notified this year, 1898, to discontinue? A.—Yes, through Mr. Mabey, solicitor, who was instructed by the Board at a meeting held on June 25th, 1898.

Q.—Did you receive notice to produce witnesses before Dr. P. H. Bryce in a letter from P. H. Bryce, dated Sept. 12th, 1898? A.—Yes.

Q.—Did you receive letter, submitted by you, from R. R. Lang, City Clerk, dated Sept. 7th, 1898? A.—Yes, this is the first and only communication from the city authorities to the township authorities in reply to their several communications. I have not replied to it and the township authorities have held no meeting with the city authorities with regard to the matter. No answer was sent as I received the notice from Dr. P. H. Bryce, dated Sept. 12th, before any action could be taken.

By Mr. McPherson:

Q.—You cannot say personally that you know of the pollution of the river, or of anyone's health being prejudicially affected by the state of the river. A.—I cannot give evidence of such pollution or of anyone injuriously affected.

Q.—Who was Chairman of the Board of Health in 1885 and 1886. A.—Mr. Lang

Q.—Was Mr. Fram a member in 1887? A.—Yes.

By Mr. McPherson :

Q.—Have you ever complained to the County Council regarding the connection between the County Building and the river before August, 1898? A.—Not to my knowledge.

By Mr. Woods :

Q.—Was there three or four years ago an outbreak of typhoid and diphtheria in the township? A.—Yes.

By Mr. Woods :

Q.—Do you know that such was not due to the pollution of the river? A.—I could not say whether it was or not.

Q.—Do you know Wm. Woods in Downie Township? A.—Yes.

Q.—Were there cases of typhoid in Mr. Woods' family at that time—whose place is near the river? A.—Yes, I knew of one case.

Q.—How far is Mr. Woods below the city? A.—It is on lot 10, con. 5, or 4 or 5 miles around by road.

Q.—How near is the house to the cheese factory and piggery? A.—About 45 rods, and about the same from the piggery.

Q.—Is this cheese factory and piggery one which has been referred to in reports to the Provincial Board of Health? A.—Yes.

(Signed) PETER SMITH.

R. H. PACKHAM, (sworn) :

I reside on lot 4, concession 2, adjoining the city corporation.

Q.—How long have you resided there? A.—For three years past.

Q.—Does the river run near your farm? A.—Yes, within 25 rods of the house.

Q.—Are there many in your family? A.—Only my wife and myself.

Q.—How long have you known the river near where you reside? A.—About 15 years.

Q.—Can you say there is any difference in the appearance of the stream since you have known it? A.—I do not think it as clear as when I went there three years ago.

Q.—What difference have you noted? A.—It is often bad-smelling, muddy looking, and with a scum on it; sometimes it is black.

Q.—Do you know what this is due to? A.—I believe it due to the sewage and the woollen mill.

Q.—Will your cattle drink the water? A.—Yes, if they cannot get better, but they prefer well or spring water.

Q.—Are there growths along the shore that used not to be there? There is a slimeiness along the shore and abundance of weeds.

Q.—Is this a slow running stream? A.—When low it is slow, not more than 6 inches deep, and at one place not more than 5 feet wide. This is on my farm.

Q.—How far do you live from the nearest sewer outlet? A.—A little over 100 rods.

Q.—Do you live near the island on your farm? A.—About 30 rods. The river is narrowest at the island on my side, but the stream is wider on the west side of the island.

Q.—Do you use water from the river? A.—No.

Q.—Where is your well? A.—It is higher than the river and has a depth of 25 feet.

Q.—Have you ever smelled bad smells at the house? A.—No; but if you go near the river in the evening in summer there is a bad smell.

Q.—Have you had any sickness which you attributed to the river? A.—I cannot say that any of my family have been injuriously affected from the river.

Q.—Are you in the dairy business? A.—No, and do not use the water from the river.

By Mr. Woods :

Q.—Is the outlet of the sewer spoken of by Mr. Davidson, on the lot next yours into a living stream? A.—No; I have seen it running quite freely in spring, but pretty well dried up in summer.

By Mr. McPherson :

Q.—Have you known typhoid or diphtheria near you? A.—No, but some cases further down the stream. I have springs on my place, but if I had not I would not like to use the milk from cows drinking the river water.

(Signed) R. H. PACKHAM.

WILLIAM WOOD, (sworn) :

I am a farmer residing in Downie Township.

Q.—Where is your house? A.—It is above the cheese factory. I have lived there 59 years. The Avon was known as a trout stream with lots of fish. I used to drink of it often as it was clean then. Now it is dirty, has dirt accumulating on top of it, which looks like a thick scum. This is wherever there is an obstruction, and if stirred up there is a terrible smell. It is worse in low water in summer, but is not as bad since the rains came. The river water rises and falls daily.

Q.—Have you springs? A.—No; I have to use the river water for the cattle as I have no springs. Where the water is stirred up the smell is like a privy. The horses seem to dislike the water.

Q.—Have you ever had typhoid in your family? A.—One of my girls came home with it from the neighbors who lived on a farm not far away where there were other cases.

Q.—Have you had sickness directly attributable to river water? A.—No.

Q.—Do you supply the cheese factory with milk? A.—At times.

Q.—Do the cattle stand in the stream? A.—Yes, much in hot weather and fly time.

Q.—Do their udders become soiled? A.—I have not noticed it specially.

Q.—Do you think it good water for the cattle to drink? A.—No, not from the amount of filth present.

Q.—How long since you drank water out of the river? A.—Not since I went to school.

Q.—What was the river like in 1885? A.—Very different from what it is now.

(Signed) WILLIAM WOOD.

H. A. SOUTHWICK, (sworn) :

I am a cheese-maker and proprietor employed in making cheese at the factory lot 11, con. 6, in Downie Township.

Q.—How long have you been there? A.—Since 1885.

Q.—Is the river clear above the factory? A.—No, it has been in bad condition this summer for cattle to drink. It is oily looking, at other times green, at other times contains lumps of matter which would stop behind any obstruction. This is the case as it comes over a gravelly bottom past the factory. The water is about 5 feet wide at this point and 8 inches deep. The factory is about thirty feet from the river. I have not noticed smells from the river while in the factory. I get milk from farmers whose cattle drink the river water. Some of them are on farms nearer the city than is the factory. The factory is six miles from the city. Much whey is sent home in cans. There is a pig pen some 350 feet from the factory and 30 feet from the stream. We keep 50 pigs. The drainage is not from the pens into the river.

Q.—Has your experience been that the milk from cows which drink or come in contact with such polluted water as that described by you in the river Avon is affected unfavorably? A.—Yes, my experience is that milk from such cows takes on a bad flavor. I have sent home milk with such bad flavor coming from such cows.

Q.—Have you a large family? A.—Four of a family and two men. We have had no sickness for several years past.

Q.—Have you noticed during the fifteen years an increased pollution of the river? A.—It has been more polluted this spring than I ever saw it before.

Q.—(By Mr. McPherson). Who was it whose milk was returned? A.—I am not prepared to say. At least one person's milk.

Q.—Do you know of anyone's health being affected by the polluted milk? A.—No.

(Signed) H. A. SOUTHWICK.

THOMAS DUNN, (sworn):

I am a farmer and reside on lot 5, con. 2, Downie Township, adjoining the corporation of Stratford. The river Avon runs through the south-east corner of my farm. I have lived on the farm for 52 years. It was then a clear trout stream fit for drinking purposes. Now it is filthy. I see no fish except in spring. I attribute the state of the river to the filth of the town of Stratford. Am about a mile and a half below the town. The appearance of the river when filthy is a green scum all over it, as in hot dry weather. It smells badly at times. The scum was not on the river years ago. The water on the stream above Stratford is not the same as it appears on my farm. My cattle drink and stand in the river. I have never noticed any difference in the milk since the cows go to the stream. I think, however, that the stock have not thrived as well. Last year I found a two-year old dead on the bank of the stream. I do not know what caused its death.

Q.—How many cattle have you? A.—Some 22. Have springs, and two wells and troughs. About one-half the cattle shut back and have access only to the river. These are the young cattle. Q.—How far is your home from the river? A.—About 40 rods. I have noticed a fog rising from the river some nights, producing a disagreeable smell.

Q.—(By Mr. McPherson). Have you known anyone's health to be affected by the river? A.—No. A few of my cattle were sick last summer (1897). We kept them in gave them a little medicine, and kept them from the river water till they were better.

(Signed) THOMAS DUNN.

R. A. BALLANTYNE, (sworn):

Am a tenant on the farm, lot 10, con. 4, Downie Township, the next farm on comes near the cheese factory. The river runs through the farm. Do not live there. I do not consider the river water fit for cows to drink. There is a scum on the water where it is still; a greenish growth. My horses won't drink it. The stream is about 20 or 30 feet wide and one or more feet deep above the cheese factory.

Q.—(By Mr. McPherson). Have you heard of anyone's health suffering from the water? A.—No, but know of no one ever drinking the water. I have bathed in the river once this summer, but it was not very clear or very deep.

(Signed) R. I. BALLANTYNE.

STRATFORD, Sept. 17th, 1898.

The Committee met at 10 a.m. in the Court House.

DR. J. A. ROBERTSON, Medical Health Officer, of Stratford, (sworn):

Have been Medical health Officer for eight or ten years. Did in June last make report to the Local Board of Health on the matter of the sewage disposal, urging that the Council adopt some suitable means of treating the town sewage. I am not aware that the Board has received any reply from the City Council. The total houses in the city are probably 1,500 at least. There has been public water since 1885. There are 150 to 200 water takers.

Q.—What is the number of water closets? A.—I am not aware how many water closets are established in the town.

Q.—Can you tell the Committee how the house sewage is disposed of? A. House drains which carry sewage and all house slops empty in some cases into the town sewers, and in others into the open ditches along the street, also into Romeo Creek. All of the creeks and drains lead to the Avon. Romeo Creek has been from time to time deepened, principally to prevent weeds and to make a better outlet for cellar drains. The same deepening has been made use of by some householders for receiving sewers from houses with water closets and house sinks.

Q.—(By Mr. Wood). Do you know the creek near the Collegiate Institute? A.—Yes, I have noticed smells along it in the evening.

Q.—Do you think Romeo Creek from Erie St. to the outlet in a sanitary condition? A.—No, as it is used as the outlet for privies, and house drains.

(Signed) J. A. ROBERTSON.

ROBERT PEARSON, (sworn):

Have been caretaker of the Collegiate Institute for 10 years.

Q.—You live in the building with your family? A.—Yes.

Q.—You know the creek near by? A.—Yes.

Q.—Is the neighborhood savory or unsavory? A.—It is very bad smelling at times.

Q.—How many pupils and teachers are there? A.—200 pupils, and 7 teachers.

Q.—How many members in your family? A.—There are 8.

Q.—When was the method of disposal of the sewage of the building changed? A.—About 2 years ago. Before that there were outside closets. When these were done away with closets were put in and a drain laid from them to the river.

Q.—About what is the distance? A.—About 300 feet.

Q.—Do you know of any obstacle why proper receiving tanks should not be put in and the sewage purified? A.—No.

Q.—Do the house sinks connect with the closet drain? A.—No, they are laid to the river by separate drain.

By Mr. McPherson:

Q.—Does the bad smell arise from Romeo creek or from the river? A.—It arises from the creek on the south-west side, the collegiate drain enters the river about 50 feet from the mouth of the creek.

(Signed) R. H. PEARSON.

THOMAS WOOD, (sworn):

I am a farmer and live on lot 13, con. 5, Downie Township. I live just below the cheese factory, about one farm below Mr. Wood's farm. There is no noticeable difference between the river at his place and mine. The river at my place is different at different times of the year. In July and August when the water is low there is a dirty green scum at any eddy or obstruction. A greyish substance sticks on the stones when the river is low. Rain water takes this away. There is a smell in the evening at times, and there is often a disagreeable smell in the morning. I was born on the farm. The stream used to be a clear trout stream. I have gone fishing and seen two-thirds of a patent pail of trout caught. There are no trout now, and I do not think they would like the stream.

Q.—Do your cattle use the stream for drinking? A.—They usually go to the spring trough, although I have seen them drink out of the river. I do not think the water healthful for the cattle. They stand in the stream in hot weather. I was talking with a ferrier about my cattle with sore eyes. I think the flies cause the sores, and then the cattle in the stream splashing the water on the sores tends to make matters worse. The veterinary surgeon thought this would tend to make them in the state they were. I do not send milk to cheese factory. I am not aware of any sickness in persons I know of as due to the stream.

(Signed) THOMAS WOOD.

JOHN PETHICK, (sworn):

I live on lot 3, con. 3, Township of Downie. I have lived on the place during the last 20 years, and have been in the township since a boy. I have known the stream since a boy, and it was then as clear as any stream I ever saw. I know it was a trout stream at one time. The river water this summer has been in a filthy state. At times with a width of a rod or more you could not see the water for the filth on the surface. I have seen it worse in places where the river is sluggish.

Q.—How is the river at Hootin? A.—I do not know. The school I attended was near where the cheese factory now is. The river does not look so bad now that the rains have washed the stream out. When the mass which collects gets going with the wind it goes down the stream in lumps. I have taken a pole and broke up a mass and found a stinking smell like a closet. This is worse on some days than others. Worse on a dull, foggy morning.

Q.—Where is your house? A.—My house is 40 rods or so from the stream and we notice the smells coming up from the river at times as far as the house. It is the same smell as down at the river. My cattle will not use the river water. I send milk to the factory.

By Dr. Kitchen :

Q.—Have you known of milk being returned on account of this stream? A.—No; but I do know that milk has been brought home by my boy who drives, as not being fit for making cheese. The land along the river valley is all pasture land, and considered the best by all the farmers.

Q.—Do you know of any sickness caused by the river water? A.—I cannot say that any sickness in my house or neighborhood has been caused by the river.

Q.—Who is your neighbor? A.—Forbes Edmunds.

Q.—Do you know that he had two cases of typhoid fever several years ago? A.—Yes, but I do not know the cause.

(Signed) JOHN PETHICK.

WILLIAM CLAWSTON, (sworn):

I live on lot 7, con. 3, of Downie. I have lived on the said lot since I was born. Am next up the stream from Mr. Pethick.

Q.—You heard Mr. Pethick's evidence as to the stream? A.—Yes; I agree with him, but I think it worse than he made it. The grey matter is like he described it. I have not noticed any oily stuff at Dunn's bridge. The river is dirtier than it ought to be.

Q.—Do your cattle drink the water? A.—I do not think the water good for cattle. My cattle do not like to drink it, though they have to drink it as I have little else. The water now is much worse than it was ten years ago. It is getting worse all the time. It often has an offensive smell, bad when stirred up. I have smelled it as far as the house occasionally. We live 40 or 45 rods away. The grey matter is like refuse from water closets cleaned out.

By Mr. McPherson:

Q.—You are in sight of Dunn's bridge? A.—Yes.

Q.—You have seen boys bathing there often in warm weather this summer? A.—I bathed once this summer in the river when it was clearer than usual, but it was not fit for use. Our cistern was dry.

(Signed) WILLIAM CLAWSTON.

GEORGE FRAME, (sworn):

I am a farmer and reside on lot 15, con. 4, Dowie Township. I am now member of the Local Board of Health of Downie, and was member of the County Council in 1887. I was not a consenting party to the sewage from the county buildings going into the Avon, and stood for earth closets at the time, as the people down the river were complaining of sewage in the river. I have always been interested in the state of the river. I saw it two days ago just outside the boundary of the city for half a mile, and it ran along like whey and not like water at all. At Dunn's bridge I see it occasionally and it does not appear well. I do not think the water fit for anything, much less to drink. I know there has been since 1885 an objection to the pollution of the stream by the farmers of Downie.

(Signed) GEORGE FRAME.

GEORGE WOOD, Reeve of Downie, (sworn):

I am chairman of the Local Board of Health in the place of Mr. Lang, who has retired from ill health. This is my second year as reeve. Was in the council before. There were protests to the city for years against the pollution of the river. I do not live on the river, but see it occasionally. When I have seen it in July and August it looked bad. I would not like to have the water used, and would not like a farm on the river, for it is of no use to a man, it is an injury. I am not sure of any cases of contagious diseases occurring along the river which the Board had to deal with, except one case this summer, but do not know the cause.

(Signed) GEORGE WOOD.

JAMES CLYNE, (sworn):

I reside in the Gore of Downie. Have been member of the Local Board of Health since 1885, since organized. Have had to do with school water, cheese factories, and pollution of the Avon. I know that protests against the pollution of the river have been continuous for years. General complaints have been made against this pollution. Twenty years ago it was a clear, fine stream; for ten years it has been a polluted, dirty stream. I have recently seen it above the city and it is as clear as it once was below. I know good water, as I live on a clear spring creek.

By Mr. Smith :

Q.—How long since the stream was in a filthy state? A.—Have noticed that during the last fifteen years it has been getting worse.

Q.—Is it worse in low water? A.—Yes.

Q.—Do you know the cause? A.—Yes; I think the sewage from the City of Stratford explains it.

Q.—Have you seen it often? A.—Yes, occasionally.

Q.—You base your evidence on the casual observation of the river? A.—Yes, from the materials I have seen in the river in the city, I think its condition is explained.

(Signed) JAMES CLYNE.

THOMAS STEELE, (sworn):

I live on lot 21, con. 10, of Downie. I am a member of the Local Board of Health, have been for three years.

Q.—You are aware of the complaints regarding the river? A.—Yes; I have therefore given the matter attention. I have frequent occasions for observing the river and have seen it at different points at different seasons of the year. In general terms I would say that the water of the stream where I reside will compare favorably with other streams. There is more than 10 miles of river from Stratford at Avonton. I never could notice pollution, but there was complaint made to me of smell at that point. Farther up the nearer you get to Stratford the river is more polluted. 3 weeks ago I went by Dunn's Bridge to inspect the river. Its appearance was very bad. Mass of solids in the running water. This cakes in stagnant water. You could not see the water under the scum. The smell was bad. I remember crossing between the cemetery and the hospital some three years ago. I saw a similar collection on the water and the water was dark and oily. In fact the nearer you came to the city the greater seems the pollution, and as the last witness stated the farther you get above the city the clearer the river gets.

Q.—(By Mr. Smith). Is there not a mill in Stratford which pours much inky matter into the sewer? A.—Yes; but I do not think this accounts for the solid matter floating on top.

(Signed) THOMAS STEELE.

The minutes of the Local Board of Health of Downie were handed to the Provincial Board of Health for reference.

W. F. VANBUSKIRK, C. E. (sworn):

At the request of the Committee of the Provincial Board of Health said:

Have been City Engineer of Stratford for one year, but have lived in Stratford for about three years and have done occasional engineering work during the last three years for the city. My duties include all new work, its design and construction, and general adviser to the Council. There are some 5 or 6 miles probably of new sewers constructed within the last 8 or 9 years, designed for sanitary sewers, but so far have been used principally for cellar drainage and street water. Heretofore private parties have been in the habit of connecting house cellar with sewer without permission in many cases, but in others permission to tear up road is obtained from the Street Commissioners. No records have been kept of drains put in on permits, but we do now. Cellar drains constructed latterly have been of vitrified pipe. There is no available information as to whether such tile drains are not used for draining privies and sink water. The number of water closets is small and must be because the water service is small. There are not probably more than 200 houses supplied with public water service. There has been a gradual increase of house sewers. The City Water Co. supplies water to the railways and the shops which employ some 600 hands. There are only privy vaults so far as I know at the G.T.R. workshops. A large amount of the water from the shops comes into a tile drain emptying on St. Patrick St. by an old box drain to Romeo Creek. This water is used for washing boilers they tell me, and I have an idea that there is a urinal connected with it, but I do not know for certain. It at any rate arrived in the creek as dirty water. There are several factories employing a number of hands in the city. I have no idea how many house connections have been made between water closets and sewers, but there are hotels and other buildings connected.

Q.—Is there at the present time any scheme which has been adopted by the city council for the treatment of the sewage of Stratford before allowing it to flow into the Avon? A.—There is a scheme drawn up by me last month under instructions of the sewerage committee of

council for disposing of the city sewage. The plans were before the Provincial Board of Health, and the scheme is at present under consideration by the city council. I am not aware of any objection having been made by the Provincial Board of Health to the prosecution of the scheme.

Q.—What steps are required now for carrying out this work? A.—The adoption of the scheme by the council, and the submission of a money by-law to the people.

Q.—How long would be required to have such a by-law submitted? A.—I think it requires advertising for about a month.

Q.—Could the work proceed in winter? A.—Not very well, the greater part could not be done in winter.

Q.—(By Mr. Smith). What has been the cause of the delay in the adoption of some scheme? A.—The city's sewerage committee which has been studying the question of sewage disposal have been under the impression that there was no hurry owing to the small number of sewer connections.

Q.—(By Mr. Smith). When did you report to the council your scheme for sewage disposal? A.—About the end of June, 1898.

Q.—Do you remember a deputation appearing in February, 1896, before the Provincial Board asking permission to extend and alter the sewerage system of Stratford? A.—As I was not there I could not say positively.

Q.—Are you aware that the extension made in that year was dependent upon the council having arrived at some plan for the disposal of the sewage by the end of the year? A.—Yes, the deputation went to get permission to make changes in the outlet and others, which were proposed by me. These changes presupposed a method of disposal of sewage by gravity instead of by pumping. The council at that time was satisfied that the sewage could be disposed of on a farm, but I practically condemned the scheme as I found there was not sufficient area for precipitation at a reasonable cost, and so have advised a system of sedimentation and filtration.

Q.—Are you aware that such a scheme has been practical elsewhere? A.—Yes, and can be constructed at a reasonable cost. (In answer to Mr. Smith) The city council has not allowed the matter to drop long.

Q.—(By Mr. Maybee.) Do you know of any sewers constructed by the city emptying into Romeo or Shakespeare creek? A.—Yes, one on Gore St. built some three or four years ago. It is nearly one half mile long and empties directly into Shakespeare creek. I do not think there are many house connections because the sewer is perfectly dry sometimes in summer.

Q.—What others? A.—An old sewer on St. David St., a box drain built twenty-one years, empties into Shakespeare creek.

Q.—What others? A.—John St. sewer empties into the river. Has not very many connections for its length.

Q.—What others? A.—About all the others enter the main sewer.

Q.—Do you know of sewers from buildings emptying into these streams which could be connected with the city sewers. A.—Yes, I know of several.

The redress for Downie township would require not only sewerage disposal works then, but enforcing new sewer connection between houses and sewers instead of into creeks, and also leading some existing sewers into the trunk sewers, and also a large extension of the lateral sewers on the Macdougall plan, and the prevention of pollution by dumping garbage and refuse into the creeks and river. A.—Yes.

Q.—What would be the cost of completing the trunk sewer along the south side of Victoria Lake from the skating rink to the main outlet sewer as per plan. A.—About \$2,500.00.

Q.—This money raised by by-law some two or three years ago by debentures is available for the purpose is it not? A.—Yes.

Q.—Is there any reason for this work not being done? A.—No local demand for its completion, and other work was pressing.

Q.—Would the sewer intercept the sewage now going into the pond and river? A.—Yes, such as the collegiate institute, the court house and gaol, Dufton woolen mills, and government buildings.

Q.—What buildings on Ontario St. drain into the river and pond? A.—Only the Post Office.

Q.—Do you know where the sewage of the Gordon Block goes? A.—I have not followed the pipes in the building.

Q.—You put down a sewer on Market St. last year? A.—Yes, but the only connection with that from the Gordon Block was one under Mr. Hardy's store.

Q.—Do you claim that all private water consumers have water closets? A.—I do not know.

Q.—Some of these water consumers use cess pits? A.—Yes.

(Signed) W. F. VANBUSKIRK.

Mr. Mabee submitted table of pumping of water works as follows :—

June, 1898.....	605,838 gallons.
July, 1898.....	662,829 gallons.
August, 1898.....	659,596 gallons.

Mr. Judge Woods further said :—Dealing with the main sewer will by no means remove the evil. The township has tried twelve years to get redress and could not. We hope that the report will bring home to the people that the township has striven in vain.

Mr. VanBuskirk presented the committee with a copy of the city map.

The above evidence concluded the investigation.

REPORT RE PORT DALHOUSIE DRAINAGE NUISANCE.

By the Secretary.

TORONTO, June 29th. 1898.

To Dr. Considine, Medical Health Officer, Port Dalhousie, Ont.

DEAR DOCTOR,—In compliance with the request contained in your letter of the 8th inst. I beg to report that I visited the Village of Port Dalhousie on June 22nd., and in company with yourself, the Reeve and several other interested parties examined the several places complained of as nuisances from local drainage. In both instances I found the complaints borne out by facts, and see no way of an effective and permanent remedy except by the construction of two drains under the local improvement clauses of the Municipal Act, being sections 668 and 669 of chapter 223, R. S. O. 1897. The Public Health Act directs that the Local Board of Health abate nuisances, and this is the ready way of having the work done and the cost assessed.

I would therefore advise that,

1st. A 6" glazed tile sewer be laid along Main Street at such a level as will be out of danger of frost, and so that a flush may be readily be supplied to it, in the absence of regular water works, from the canal basin.

This work must be done by the corporation, leaving an offset for house drainage to each lot, and thereby the householder will be enabled to make a four-inch tile drain connection properly trapped to his premises. I forward a copy of our Model Plumbing By-Law for adoption by the Council as a Village by-law.

2nd. A similar drain should be laid down the Ravine at the back of the stores on Main St. to the canal for the drainage of the properties contiguous. In addition to the sections of the Municipal Act already quoted, I refer you to section 673 expressly dealing with the distribution of cost of local improvements.

I further advise the Council to employ some engineer accustomed to dealing with the local assessment of land drainage, both to make a plan and supervise the construction of these sewers as well as to report on the properties to be assessed.

I shall be pleased to learn that the beginning has been made of a sewerage system for the town, which with a little energy might be made cleanly and attractive for many summer visitors and healthful for its own inhabitants.

Please lay this report before the Local Board of Health and the Village Council as soon as possible.

REPORT *RE* LONDON PACKING COMPANY NUISANCE.

Toronto, Jan. 26th, 1898.

To the Members of the Provincial Board of Health.

GENTLEMEN,—Your committee to whom was delegated the duty of inspecting the establishment of the London Packing Co., in September last, reported at the last meeting of the Board that they had proceeded to Pottersville, London Township, and had taken evidence on September 14th 1897; and further that in view of the verbal opinions then and subsequently expressed, regarding the method of removing the cause of further complaints, and the statement made in a letter by the Manager Mr Ginge, dated Oct., 8th 1897, that he was then taking steps to carry out the Board's expressed opinion, that by an elevated tank, the effluent from the factory, might be pumped and then run by gravity to the lighter land of the field, there to be utilized as a sewage farm, your committee did not deem any more formal report necessary.

Inasmuch however, as information has been received both from the Reeve of London Township, and Mr. Shore, M. P. P., during the last month, that the company has as yet taken no action towards carrying out the proposed improvements, your committee does now beg leave to report.

1st. That it finds from personal investigation in both June and September, 1897, that the disposal of the waste effluent from the factory, was not of a satisfactory nature, and that both an aerial nuisance exists, and that the creek was notably polluted below the factory.

2nd. That the sworn statements of different witnesses further give evidence that such conditions of nuisance are more or less constant, and that the then existing modes of disposing of the effluent from the factory, were insufficient to prevent a recurrence from time to time of the nuisance.

3rd. That in the opinion of your committee, the abatement of the nuisance especially complained of, viz., the polluted waters of the creek, demands that the effluent wastes be discharged on a much larger area of land than at the present for filtration, and at a distance farther from the border of the stream.

4th. That in the opinion of your committee, the proposition contained in the letter of Mr. Ginge, the Manager, will be a simple and efficient mode of abating the nuisance, provided that the land used is kept deeply ploughed and permeable to air, and that after every discharge into furrows, the furrow be turned over the wastes by which the absorption of the gases of putrefaction will be complete.

5th. While subsoil drainage would increase the porosity of the soil and its ability to deal with the wastes, the necessity for this is a matter of detail depending upon the area of land used, and the amount of the daily sewage.

6th. That the beneficial effects of the utilization of sewage of the London Asylum, and solid refuse from the packing factory daily hauled to the Asylum gardens leave your committee no room for doubt, but that the cost of the disposal of the effluent wastes from the factory can be practically made up by the increased produce from the sewage farm.

7th. That in the opinion of your committee, the Local Board of Health will now be justified in taking action as provided under section 64 of the Public Health Act, subsection 2 in seeking an Order of the Court to compel the Canadian Packing Company to at once introduce such methods as will abate the nuisance.

All of which was respectfully submitted.

(Signed) J. D. MACDONALD,
E. E. KITCHEN,
P. H. BRYCE.

INSPECTION OF OAKVILLE SLAUGHTER HOUSE.

*By J. J. Cassidy, M.D.**Toronto, August 10th, 1898.**P. H. Bryce, Esq. M.D., Secy. Prov'l Board of Health, Toronto, Ont.*

DEAR DOCTOR,—I went to Oakville on the 6th inst. by the 2.10 p.m. train, I called upon Mr. W. S. Davis, town clerk, upon my arrival, and he accompanied me to the spot where the nuisance complained of was said to exist. (see Mr. Davis' map). The Public and High School is a large building of two stories, situated on Main street, and the rear portion of the school property runs along the bluff skirting the valley of the Twelve Mile Creek. Situated on the street and in front of this school is a well, worked by an iron pump. It is a public well. On testing it there was found to be a good supply of water. At this spot, beside the well, the disagreeable odor of pig manure was perceptible though no wind was blowing. Mr. Davis said that in damp weather the odor was much more disagreeable.

Entering a lane, which skirts the eastern side of the school enclosure for a short distance and then turns at right angles towards the west, we walked up to the slaughter house, which by measurement (estimate) is not more than 270 feet from the eastern wall of the school house. The slaughter house, which looks like an old wooden stable, is situated immediately in the rear of (about 30 feet from) Mr. Hillmer's house. Mr. Hillmer lives in this house. The slaughter house contains a killing room, a pen, and a third room which might be used for preparing and dressing meat for market. These rooms all communicate by openings. A rough wooden trough protrudes from the lower part of the frame, and was said by Mr. Davis to be used to catch blood from the killing floor. The walls of the killing room were stained with old blood. Ashes had been scattered on the floor, but the odor from the premises and the surrounding ground was of a very disagreeable character. No well was visible, and on inquiry I was told by Mrs. Hillmer that the necessary water required at the slaughter house was obtained from a well situated inside their cottage. In a pen near by were two calves. I saw no other animals intended for the market.

Accompanied by Mr. Hillmer, Sr., owner of the property complained of, I descended the steep bluff which runs at the rear of the school property and Mr. Hillmer's lot, and walked through a piece of swamp land lying at the base of the bluff along the course of the Twelve Mile Creek. Mr. Hillmer told me that he rented ten acres of this swamp and allowed hogs and cattle to roam over it. He said that offal from the slaughter house was fed to the hogs. The odors arising from this swamp were disagreeable. It occurred to me that a few drains running from the swamp into the creek near by would be of service in removing a lot of offensive vegetable and animal debris from this unsavoury locality. It may also be true that some of the odors complained of may be due to this swamp. Skirting the bluff, Mr. Hillmer and I returned to the street close to Mr. Hillmer's house which is situated on the same side of the street as the school house.

The charge against Mr. Hillmer, *i. e.*, that the slaughter house kept by him is malodorous and is not sufficiently removed from the school house, his dwelling and the street is true. Mr. Hillmer contends that the well in front of the school house is public property and can be used by him and his servants if they wish. He denies using it and showed me another good well belonging to him which was situated a short distance from the school.

Mr. W. H. Young, ex-mayor of Oakville, whom I saw afterwards, informed me that there was a second slaughter house situated in the eastern end of the town against which complaints had been made in 1897 but not so far during the present year. He said this building had originally been used as a stable. I did not inspect it.

I am, very truly yours,

(Signed) J. J. CASSIDY.

REPORT OF NUISANCES BY RAILWAY CATTLE YARDS, PIGGERIES AND SLAUGHTER HOUSES.

By the Secretary.

Toronto, August 12th, 1898.

Mr. Chairman and Members of the Provincial Board of Health :

GENTLEMEN :—By reference to the correspondence herewith submitted by your Secretary, it is apparent that the disposal of animal refuse is a subject, not only responsible for a nuisance and danger to health of a most important character, but one which, hitherto our Local Boards of Health have found themselves incapable in a large degree of dealing with. Some of the reasons for this are :—

1st. That such materials owing to their being incidental to the growth and development of our animal industries, necessarily not only exist, but tend to increase in the growth of such industries.

2nd. That they occur in manure heaps in quantities on farms, and their existence is looked upon as not only necessary, but harmless.

3rd. That being in our towns and cities looked upon as waste products, they are considered rather as a nuisance than an article of commerce.

4th. That owing to badly located cattle-yards and stables as well as defective construction, and the absence of means for systematic and effective cleaning, these materials harmless at first in themselves, are allowed to accumulate, and by decomposition allowed to become productive of most serious nuisances.

5th. The varying character as regards nuisance of the several classes of animal refuse.

By reference to the correspondence it will be seen that the materials are divided into three classes practically.

1st. Those incidental to the stock-yards, and notably hog-pens, which are used for shipping animals along our chief lines of railway. Commonly the station is in or near the village or town, and with habitations close at hand. At first there was but an occasional car shipped, but this has grown to several or many during the week. Yards are enlarged generally close to the freight stations. Often on railway property for public convenience, such are at first not a serious nuisance, since the animals are in a pen and are loaded on the car when they arrive at yard. Now, however, a number of car-loads are often collected in lots, the result being that several hundred animals are kept for from 12 hours to several days in these yards, which have now been specially constructed for them ; and hence it happens that these become littered with manure which is tramped into the ground, which is not covered over against the wet, and has added to it the refuse food which is carelessly fed the hogs in crude troughs. While care to remove regularly as much as possible this animal refuse is often seen at some cattle yards, yet at others very great indifference is shown ; and in almost every case the work of removal cannot be thorough, owing to there being no floor but the ground, no roof to protect against the water, and no water with efficient drainage to flush the floors. So as far as your Secretary is aware, no properly constructed and equipped cattle and hog-yards exist at any market or railway station in Ontario ; and the complaints are wholly dependent upon the amount of business, the location of the yards and the incident of having a soil varying from a heavy clay to the lightest sand. In some cases again, the nuisance of yards is added to by the cleaning of cars at points near dwellings. If flushed, the refuse water lies putrefying along the railway, or if drained into a creek becomes the frequent conveyor of hog cholera to the neighboring farms.

Illustrations of complaints regarding this class of nuisance will be found from Teeswater, Rodney, Walkerville, Tweed, Galt, Creemore and elsewhere.

A second and most serious class of such nuisances arises in connection with the piggeries which exist in the neighborhood of cheese factories and creameries for using the whey and milk supplied by them.

The causes of the nuisance are the same, and the nuisance is much more extended, since the hogs are kept and less care even is usually taken to give them good pens. The first class located in towns and cities, generally affects more persons directly and are more likely to be kept fairly within bounds; but the latter too often create a larger evil, affecting the commercial character of the cheese and butter products. Besides this, the old complaint of sour whey being carried from cheese factories in the very cans used to bring fresh milk to the factory seems to-day to prevail as formerly.

For instance, I visited very recently a new cheese factory, started this year, and found the whey-tank an open wooden cistern sunk in the ground and within three feet of the room where the cheese was made, the pipe leading without a trap directly from the barrel to the room, while at a distance of one hundred feet was an elevated tank with a hose attached by which the factory patron could fill his tins as he started for home.

The illustration affords food for reflection as well as supposedly first-class food for the English market.

The third, and even more common source of nuisance is that from slaughter houses. The most miserable of all structures, usually in the outskirts of a town or village, without a tight-floor or a single convenience for properly collecting blood and offal, either for boiling or removal; no drainage, no water supply for proper flushing; these sources of the meat foods of our people, abound almost everywhere, and the horror is added to by the almost universal feeding of raw and decomposing offal to the hogs, which is to be turned into pork. The persistent and continued existence of this evil we speak of, legislation regarding which has been placed on the Statute books for the use of Local Board of Health, is not more a commentary upon the wholly inadequate basis upon which Local Boards are established and carry on their work, than upon the indifference of the public who patiently endure such a condition of affairs.

I shall refer to but one instance illustrated in the correspondence from Oakville.

May 19th.—A complaint received regarding nuisance caused by slaughter-houses and piggeries near the schools.

May 20th.—Clerk notified and asked to explain by diagram their location and whether licensed, and how refuse was disposed of.

May 25th.—Clerk makes reply. States slaughter-house is on bank of creek; refuse fed to hogs; nothing but natural drainage; no licenses issued. Diagram shows pens some 150 to 300 feet from school house.

May 26th.—Reply sent to Local Board pointing out that Act requires slaughter-houses to be licensed and also in feeding of hogs offal to be boiled and fed fresh under penalty. Reasons given for believing the slaughter-house and piggery a nuisance, and indicating powers and duty of Local Board, also stated that the school authorities had been advised of my views.

June 2nd.—Secretary of Local Board replied, that Board had by resolution instructed Sanitary Inspector to notify all butchers to discontinue feeding offal unless boiled, and then fed in troughs. Inspector could not discover a nuisance.

June 4th.—Your Secretary was glad to know Local Board was acting, and advised a common slaughter-house for public slaughtering. If this is not done, action to abate nuisance and license must be taken.

June 8th.—Clerk replies that Board met on 7th and by resolution called attention of Town Council to By-law No. 5, prohibiting slaughter-houses within the municipality, and ask Council to enforce or repeal, and if repeal make new By-law under Provincial Health Act. Board denies wishing to injure butchers and advises a common slaughter-house.

June 8th.—Your Secretary compliments Local Board on action taken and looks for speedy action.

June 17th.—Clerk reports Council met on 13th but took no action on the communication; next meeting on 27th.

June 18th.—Your Secretary notified Town Clerk that the matter of a nuisance near school had by school authorities been laid before the Minister of Education, who had referred to your Secretary for information.

By-law 5 of town prohibits slaughter-house within the town or the feeding of any offal. Date 1887.

June 28th.—Information sent your Secretary by school authorities that nothing whatever had been done to abate the nuisance by the Local Board of Health or Council, and believes that they will do nothing, hoping that all parties will let the matter drop. The butchers water their horses at the school well.

June 30th.—Your Secretary promises he will endeavor to have action taken.

June 22nd.—Department of Education is again appealed to, and asks if this Board cannot take the matter up independently of Local Board.

Such has been to date the total result of some 14 letters which have passed relating to this matter alone.

With such an exhibition of the utter break-down of municipal government we vainly seek for a remedy. Unless a dozen Inspectors of this Board were appointed with plenary powers to prosecute it would be quite impossible to deal with such evils, unless the local health machinery of our 250 incorporated municipalities undertake the responsibilities laid upon them.

One is compelled to conclude that our newspapers could profitably write many editorials, based upon that chapter, entitled "Political Control," in the recent work on street cleaning published by Col. George E. Waring, Commissioner of street cleaning in the City of New York.

With regard to the improvement of cheese-factories when prominent cheese men appealed last winter to your Secretary to aid in the inspection of the 1,100 factories in the Province he suggested appealing to the Local Boards.

The reply was a laugh at the idea, with the remark, that members of such boards in townships are usually directors and patrons of the factory. In our villages the local butcher and drover are commonly potent factors in deciding events on the first Monday in January.

At present, the only hope of improved conditions seems to be the slow process of educating the people, not to an appreciation of the evil so much as to a recognition of their responsibilities, powers and duties as citizens, or the placing of the power in the hands of a trained county officer of health, paid to do the work, and protected in the performance of it

All of which is respectfully submitted.

[Signed] P. H. BRYOE,
Secretary.

REPORT *RE* MEAFORD CEMETERY.

By P. H. Bryce, Secretary.

Toronto, April 20th, 1898.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—As will be seen from the correspondence herewith submitted, it is proposed to establish a new cemetery, owned and managed by a company seeking incorporation under the Act relating to Cemetery Companies, on a property within the limits of the Town of Meaford, although, as will be seen from the map herewith submitted, practically outside the town and with its drainage toward a direction away from the settled part of the town and toward the lake. Your Secretary is acquainted with the topography of the town, and has not deemed it necessary, before submitting the application for your approval, to make a special inspection of the ground.

The Local Board of Health and the Town Council of Meaford have, as seen in the correspondence submitted, passed resolutions approving the site, and the consent has also been obtained of all persons living in proximity to the proposed site to the location of a cemetery thereon. As will be seen by the plan the cemetery is to be located on the ridge of hills which dips sharply northward to the shore of Georgian Bay. Apart from its present location, an admirable opportunity is given for the sub-soil drainage of the area.

Your Secretary would therefore recommend that the Board approve of the site of the proposed Meaford cemetery with the understanding that the company complies with the requirements of the several Cemeteries Acts in the matter of drainage and other particulars as are indicated therein. The report was adopted.

REPORT ON TEMPORARY SCHOOL ACCOMMODATION, UNDER PUBLIC SCHOOL BOARD, TORONTO.

By P. H. Bryce, M.A., M.D.

Toronto, May 6th, 1898.

To the Honorable, the Minister of Education of Ontario :

SIR—I beg to report that acting under instructions received from you, I have visited, in company with the Chairman of the Toronto Public School Board and officers of the Board, the several buildings referred to in the appendix to this report, occupied as temporary schools under the supervision of the Board, and have set down in a tabulated form therein the results of my inspection. The several points bearing upon the sanitary condition of these buildings are indicated in the Appendix, but may be briefly referred to herein.

They refer to

(a) Floor space and cubic air space per pupil ; (b) Play ground and location of school ; (c) Ventilation and conveniences ; (d) Lighting ; (e) Heating.

(a) With regard to floor space, 18 school rooms out of 29 inspected, have less than 16 square feet per pupil, the amount generally considered necessary. As in addition to this, the seats are usually double, it will be seen that even in cases, as in some of the churches where the cubic air space reaches or exceeds this amount, the contact of children

by such means materially increases the danger of the spread of communicable diseases from one to another. In the matter of the cubic air space per capita, 23 out of 30 school rooms have less than the 250 cubic feet required under the School Regulations.

(b) As regards playgrounds, 12 out of the 29 classes have no playground, unless it be the public streets, and in several instances as where stores are occupied, the schools are on streets along which street cars run. In such instances, as in a number of them, the stores or dwelling houses have the doors and windows directly on the streets, and the noise from passing cars and wagons must be a very serious obstacle to the proper conduct of the school, and indeed is very injurious to both teacher and pupils.

Under such circumstances, the much needed recess to escape the foul air of the school room has its good results greatly lessened, and as the classes in almost every instance are of the smaller children, this condition must on some streets become a source of danger to the pupils and a worry to the teacher.

(c) Except in two buildings (with four classes) there is no mechanism for artificial ventilation. In all other cases there is no ventilation but by windows and by stoves (not always even stoves), occasionally assisted by a stove-pipe hole, or in the sheds on the school premises a register in the chimney shaft. As the stoves were without fires in most cases, there is left at this season only the windows, and these both because of the noise and draught were in many instances tightly closed.

As will be seen by reference to the Appendix the cubic air space exceeded in seven instances the minimum required by law. These were in all cases church rooms, and had they been fitted up with good black-boards and proper lighting, they would be excellent.

In most instances the closet conveniences were not objectionable, although in five their location was such as to make odors from them likely to be noticed in the school rooms or corridors.

(d) The lighting in four only out of 29 is noted as "fair;" in the others it is "defective," or "very defective." The defects are due to five different causes:

1st. Where churches are utilized, the windows are usually narrow and too few, and in many instances have frosted or colored glass, and in a number colored lights at top and sides.

2nd. The proximity of windows to other buildings or to trees.

3rd. Low windows are in the sheds, where the position of the shed makes the proper location of windows impossible.

4th. The area of windows in basements. In some roomy basements, except as to obstructions to light from steam pipes, not more than three feet of window is above the ground level, and in some north rooms the teacher has to make writing with letters three inches long that they may be seen, and then imperfectly by the pupils in the back benches.

5th. The cross lighting in nearly all the basements and sheds, and the blackboards in shadow making it quite impossible in almost every instance for all the pupils of the class to see the whole extent of the blackboards.

(e) The heating in most instances seemed fair; but the season made this impossible of determination. It may be stated however, that the heating with stoves in one corner of the room presents the invariable objection of improper distribution of heat. In very many cases, as in the sheds, the wide window, hinged at the bottom, cannot be opened in winter without the cold air pouring down on children near by, while in one instance the furnace pipe was within one foot of a seat, and in the sheds and in some basements a stove-pipe passed within a few feet of the children's heads. The furnaces in the stores and dwelling houses may warm, but as there were no fresh air boxes in some instances, the reheating of room and cellar air is inevitable.

Conclusions. By reference to the Appendix, it will be seen with regret that not a single room does in all the several points fulfil fairly reasonable requirements. If ample in air space, it is defective in lighting; if in lighting fair, then in air space and ventilation.

In some instances it was plain that some intelligent care on the part of the teacher in adjusting window curtains would have increased the light or lessened the evils of cross-lights; while in others the judicious opening of a window would have, in the weather at the time of inspection, lessened the evils of foul air. But such a remedy for bad ventilation would be impossible in cold weather. In one instance where the air was very foul, not a window was raised, while a door into the attic space was tightly closed. In the greater number of instances, however, the teachers seemed to keenly appreciate the needs of the situation, and were doing their utmost to minimize evils. If, however, pale and wearied looking faces are to be taken as evidences, then it can only be said that such unsanitary conditions are producing results on both teachers and children, demanding a prompt and effective remedy.

But further it may be said that if the influences of vitiated air and defective lighting show themselves most prominently in affecting the health of the teacher, whose nervous energies are taxed to perform her work under such circumstances, they likewise affect that of the children under her charge. It will be noted that in only two or three schools is the lighting fair, and in most the air is bad or very bad. The immediate effects of foul air are to injure the nutrition of the child. The appetite and digestion are disordered, and every tissue, and primarily the nervous system, is affected. Since of all organs, the eye during waking hours is alone constantly in action, and nature has given it and its appendages nerve supply from the whole or parts of six out of the 12 pairs of cranial nerves, it will be apparent that defective nutrition will most readily be productive to it of serious disorders. Indeed actual disease of the retina has been found to have a direct relation to the poverty of the blood. Actual medical experience has shown that in 100 consecutive cases of chronic headache, 83.6 per cent. have been relieved by correcting the eye strain by proper glasses. What influence school work has in producing such abnormal vision has been illustrated by Widmark of Stockholm. Of 742 female pupils in the first forms, he found no myopia (short sight); while the percentage of short-sight in girls at 16 was 33 per cent. We may from such illustrations judge of what effects are being produced in these schools; first from the defective lighting, and second by the effects of foul air upon children for whom the teaching ought to be largely by blackboard. Teacher after teacher tells the story of how pupils, who at first could see the blackboard from the back seats, have as time has gone on had to be given seats nearer and nearer the front. The eye-strain soon produces mental weariness, and favorable results of the teacher's efforts cannot be looked for. The general disturbance of the nervous system, notably in girls, by eye-strain must inevitably produce effects life-long in their unfortunate results, and the continuance of the existing state of affairs cannot be condemned too strongly, affecting as it may the welfare of so large a number of children.

The extent of the need for a remedy for these existing evils will be understood when I state that 1,510 children were in actual attendance at the time of inspection, or one-twentieth of the total 30,000 public school population is unprovided with permanent school accommodation. When it is further remembered that the natural increase of births over deaths in Toronto, means an annual increase of population of over 1,000 (it being 1,278 in 1876), it is plain that there must be an annual expenditure for new buildings, otherwise conditions, now very bad, will become intolerable.

In the Annual Report of the Public School Board for 1897, I find it stated that during the past three years there have been no new school buildings erected in Toronto. There would not appear to be any difficulty in closing a number of these schools by taking action under the provisions of the Public Health Act, but I am assured by the Inspector

Buildings that he has used every endeavor to get public halls and churches, instead of

stores and private houses in several districts, but failed. There seems no alternative therefore, but during the warm weather to allow these schools to be continued where they are at present, in order to prevent a loss of school privileges to a very large number of children.

While suggesting this as a temporary expedient, I would recommend that your Department should put in operation whatever powers exist under the Public School Act, to bring about such a remedy for the state of affairs herein indicated, as will be permanent in its character.

I have the honor to be,

Your obedient servant,

PETER H. BRYCE,

Secretary of Provincial Board of Health.

School.	Location.	Att'ance		Cubic air space. Playgrounds.	Ventilation.	Conveniences.	Lighting.	Heating.
		Re sq	Avp					
Bathurst street. Kindergarten.	Shed	76	60	Playground of school, 130 sq. feet floor space, 145 cubic ft. air space.	Windows on n.e. hinged at bottom, not availa- ble in winter, air close.	Closets out doors, Lat- rines.	Low windows on north and east, light very defective.	Stove.
Clinton street. Kindergarten.	Church S. S.	72	63	Street principally, 12 ft. floor space, 134 ft. air space.	Windows (closed) one vent in ceiling (closed), air very foul.	Closets off passage, not ventilated, smelling.	Four windows south and west, light fair.	Furnace.
Sheridan street Kindergarten.	Church proper	38	38	34 ft. floor space, 443 ft. air space.	Double windows only (closed), air is warmed in furnace, large cubic air space.	Earth closets	Windows are narrow, east and west, light poor.	Furnace reheat- ing air of room.
St. Claren's ave. Kindergarten.	Church S. S.	65	41	Street. 15 feet floor space, 163 feet air space.	Windows only (closed), door open at time of visit.	Water closet in cellar.	Windows west and north, small.	Furnace in base- ment.
Shirley street Kindergarten.	Old building, two- room, s. w. and s. e.	54 54	46 47	Grounds of school build- ing, 12 ft. floor space, 176 ft. air space, 12 ft. floor space, 176 ft. air space.	Windows only, door open at noon hour, rooms very old and small, air foul.	Closets of main build- ing, air in one room main building foul, in- let of furnace duct closed.	Lighting fair, window s.w. and s.e.	.....
Grace street Junior 1st class form.	Basement of school building, s. w. room.	56	54	Low ceiling (8 ft) sleep- ers of floor resting on earth, playground of school and also in base- ment. 14 ft. floor space, 111 ft. air space.	Windows only (none open), cloaks hanging in room, air poor.	Closets (Smead-Lowd) splendid order.	Windows south an west, 4 feet in height light fair, but on du day children cannot see board.	Stoves.
Dawson street (a) First class.	Shed	47	45	School grounds, no play sheds, 15 sq. ft. floor space, 164 cubic ft. air space.	Windows registers near floor in chimney shaft, air foul.	Closet of school	Four shallow windows light poor, cannot see blackboard from a dis- tance.	Stove.
(b) Second grade	Shed	44	42	16 square feet floor space, 176 cubic ft. air space. Same as above.	Same as above, air foul.	Same as above	Same as above	Stoves.

Gladstone ave. (a) Junior 2nd form.	Shed	54	54	11 square ft. floor space, 110 cubic ft. air space. School grounds.	Windows hinged at bottom, low and with outside screens, regis- ter near floor in chim- ney shaft, small area, air foul. Same as in (a).	Closets of main build- ing.	Windows one south, three west, low and wide, only 10 feet from a house, lighting de- fective.	Stove.
(b) Senior 1st form	Shed	53	50	11 square ft. floor space, 116 cubic ft. air space. Same as in (a).	Same as in (a).	Same as in (a)	Windows west, light fair, only 25 feet from a privy.	Stores.
(c) Junior 1st form	House	47	43	7 square ft. floor space, 72 cubic ft. air space. No play ground.	Windows only, down, air very foul and stifling.	House closet up stairs.	Double room, long and narrow bay window to east. In parts very defective.	Furnace.
(d) 2nd form	Shed	48	46	10 square ft. floor space, 107 cubic ft. air space. No play ground.	Windows only (closed) air foul, cloak room separate.	Closet of store.	Lighting to east, defec- tive.	Furnace.
(e) Senior 2nd form.	Store	47	41	10 square ft. floor space, 122 cubic ft. air space. No play ground.	Same as (d).	Same as (d)	Same as (a).	Furnace.
Dundas street, No. 47. (a) Junior 2nd form.	Store	46	39	12 square ft. floor space, 146 cubic ft. air space. No playground.	Windows and transoms over door.	Closet in basement di- rect under stairway.	Window to west, with upper part colored, light very defective.	Furnace.
Dundas street, No. 41. (b) Junior 1st.	Store	48	38	12 square ft. floor space, 149 cubic ft. air space. Same as (a).	Same as (a).	Same as (a)	Same as (a).	Furnace.
Ryerson school (a) First class.	North-west base- ment.	66	56	16 square ft. floor space, 146 cubic ft. air space. School ground.	Windows only, ceiling 7 ft., floor on joists on ground, air bad.	Closets of Smead-Dowd system.	Windows north and west, 3 feet above ground, writing on board to be 3 in. long to be seen at any dis- tance, greater part of the room in shade.	Steam pipes and with stove.
(b) Senior 1st class	North-west base- ment.	28	26	39 square ft. floor space, 311 cubic ft. air space. Playground same as (a).	Ventilation same as (a), air fair.	Same as (a).	Lighting north and east, same conditions as (a), very defective.	Same as (a).

* Teachers report large scholars staying away on account of condition of rooms.

APPENDIX TO REPORT.—Concluded.

School.	Location.	Attendance		Cubic air space. Playgrounds.	Ventilation.	Conveniences.	Lighting.	Heating.
		Reg.	Ave.					
Ryerson school.— <i>Con.</i> (c) Kindergaten.....	South-east basement.	*80	*62	13 sq. ft. floor space, 107 cubic ft. air space. Playground of school.	Same as (a) and (b), air poor.	Same as in (a)	Same as in (a), except much better light, windows being south east, fair.	Same as (a).
Claremont street mission	Church S. S.	41	36	27 square ft. floor space, 487 cubic ft. air space. No playground.	Windows, air fair, space large.	Closet	Narrow windows, with stained borders, two to south, two to north near a house; windows average 10 square ft.; some light from sky-light, very defective.	Furnace.
Dufferin school	North-west basement of school.	*58	*54	16 square ft. floor space, 137 cubic ft. air space. Playground of school.	Windows and ventilators; air only fair.	Closet	Three windows to west only 3 ft. from ground; 4 steam pipes cross upper part of windows; light poor.	Steam pipes and stove.
(b) Kindergaten.....	South-east and south-west rooms of basement.	83	75	22 square ft. floor space, 190 cubic ft. air space. School ground.	Windows also, with steam coil in ventilator shaft; air very good.	Closet	Same as in (a), south and east windows; light fair.	Steam heating.
Oak street church.....	Upstairs Sunday school room, 2nd class separated by curtain in same room.	60	53	19 square ft. floor space, 318 cubic ft. air space.	Windows and high ceiling in gable; air very good.	Snead-Dowd system ..	Five windows north and east, two west; light defective; children in each room face towards light.	Snead-Dowd furnace.
Senior 1st form	2nd class separated by curtain in same room.	45	40	26 square ft. floor space, 421 cubic ft. air space. No playground.	Windows and high ceiling in gable.	Ditto	Ditto	Snead-Dowd furnace.
Prospect Park Rink	Club room.....	68	48	17 square ft. floor space, 225 cubic ft. air space. No playground.	Windows, no ventilation; air foul.	Closets close to hall....	Three windows west, two windows north; good light.	Furnace.

Bolton avenue..... Junior 1st.	61	49	30 square ft. floor space, 485 cubic ft. air space. No playground.	Windows; ventilators over gas jets.	Closet.....	Three windows to south, as well as sky- light and fanlight. Fair.	Furnace.
Pape avenue, No. 484... Junior and Senior 1st.	33	30	13 square ft. floor space, 137 cubic ft. air space. No playground, except neighboring field.	Windows; one fanlight hinged; air very foul.	Water closet.....	Small windows, light shut off by house dis- tant three feet; one square window with colored glass above, most of room in shadow; light most defective.	Furnace.
Carlaw avenue..... 1st form.	46	41	19 square ft. floor space, 248 cubic ft. air space. No playground.	Windows and gable; ventilation poor, aid- ed at present by doors open to next room.	Water closet....	Six windows, south light cut off by trees and house; two square windows to west; trees near.	Furnace.
Kenilworth avenue..... (a) 2nd, 3rd and 4th forms.	52	52	15 square ft. floor space, 228 cubic ft. air space. Playground on com- mon.	One small round win- dow on hinge in gable end; air foul.	Closet.....	Four windows east, four windows west, stained yellow glass, stained borders, six inch squares; lighting very defective.	Furnace.
(b) Junior and senior form	42	31	10 square ft. floor space, 106 cubic ft. air space. Playground on com- mon.	Windows open verti- cally, not open on ac- count of draught; one stovepipe vent; air very foul.	.....	Windows south, east and west, lower half of windows stained glass; light good if regulated.	Furnace; stove- pipe within one foot of seats.

* (Average 70). Two sets of children, one in forenoon, one in afternoon (170 daily).

† Only 48 seats, balance on wall benches.

REPORT *RE* INSPECTION OF SCHOOL IN TRAFALGAR TOWNSHIP

By P. H. Bryce, M.A., M.D.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—At the request of the Local Board of Health, I visited the school at the Union Section on the 9th concession of the Township of Trafalgar on May 27th, and addressed the following report to Dr. N. McCrimmon, M. H. O. of the township: I beg to state that careful investigation, with yourself, failed to find any unsanitary conditions on the premises likely to provoke an outbreak of diphtheria, such as the outbreak which occurred in April, the particulars of which were so fully obtained by yourself, with me, from the trustees, Messrs. Cook and Fullerton, and the young school mistress.

The closets are earth closets, and show evidence of close supervision, while the location of the well is such as to have made it impossible for any pollution other than what might have accidentally reached it from the surface. I would suggest that if a new well is dug it be tightly covered, with an air pipe leading in, and that the pump be placed at a distance from the well and connected by an iron pipe, covered to keep out the frost.

More ventilation of the foundation of the school than was found, is necessary to keep the joists dry.

By a careful enquiry as to the dates of the appearance of cases of diphtheria amongst scholars and neighboring families, as well as by examination of absentees as seen by the roll, there seemed fairly clear evidence of the outbreak being connected with a case or cases of sore throat of a mild character which had not been detected. Thereafter, the evidenced was closely connected with the return of children to school after Easter, who were again exposed to some case or cases who were convalescent but not free from infection in the nose and throat.

The recommendations are to have:

1st. The floors scrubbed with a strong alkali soap.

2nd. The wainscoting washed down with disinfectants under the supervision of the Medical Health Officer.

3rd. The disinfection of the seats and desks in the same manner.

4th. The disinfection of school books by steam, will in my judgement, prove adequate to the removal of any infection which might possibly, though not probably, have remained in the school. And I do not anticipate any re-appearance of cases, unless brought to the school in the clothing of some person, which has not been properly disinfected.



THE VALUE OF SANITATION AS AFFECTING THE BIRTH RATE AND OF POPULATION INCREASE.

BASED ON A STATISTICAL STUDY OF VITAL STATISTICS OF TORONTO, MONTREAL,
CHICAGO AND PHILADELPHIA.

By J. J. Cassidy, M.D., Toronto.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—It is interesting to make comparison between the vital statistics for 1897 of Toronto and Montreal, in Canada, and Philadelphia and Chicago, in the United States, in order to estimate the facts which underlie the natural increase of population in these cities. In Montreal, with a population of 262,100, the total births for 1897 were 8,850, or 32.43 per 1,000 of population. In Toronto, with a population of 183,172, the births were 4,076, 22.25 per 1,000. In Philadelphia, with a population of 1,214,256, the births were 29,591, or 24.37 per 1,000. In Chicago, with a population of 1,619,225, the births were 28,158, or 17.39 per 1,000.

In reference to the high birth rate of Montreal, Dr. Roy, Recorder of Statistics, writes that "he only gives the number of those who have been registered, and that owing to a defect in the law, registration among those who do not have their children baptized is not regularly done." In reference to the birth rate of Chicago, Dr. Reynolds, Commissioner of Health, of that city, writes that he does not get all the births that occur, probably not over 90 per cent., possibly not over 80 per cent. Occupying middle ground, Philadelphia maintains a fairly high birth rate, 24.37 per 1,000. The surprising part of the record is the relative showing of Toronto, with a birth of 22.25 per 1,000, higher than that of Chicago, but lower than that of Philadelphia.

The marriage rate of Montreal, 6.9 per 1,000, not only does not explain the high birth rate of that city, but makes it the more surprising. It seemed possible that a considerable percentage of illegitimate births might account for the high birth rate and low marriage rate. This, however, is not the reason. Through Dr. Roy, Recorder of Statistics, we learn that the illegitimate births in Montreal were 644, which sum being deducted from the grand total of births, 8,850, leaves 8,206, or a legitimate birth rate of 31.3 per 1,000.

In Toronto, the marriage rate, 8.19 per 1,000, is higher than in the other Canadian city. In Chicago, the marriage rate is 8.43 per 1,000.

In Philadelphia, the marriage rate, 12.67½ per 1,000, is highest of any of these four cities being nearly double that of Montreal.

In Chicago and Philadelphia, premature and still births are excluded from the death rates. In order to compare, on even terms, with these cities, we shall eliminate the premature and still births from the death returns of Montreal and Toronto. The deaths in these cities are as follows: Montreal, 6,939, a ratio of 26.47 per 1,000; Philadelphia, 22,375, a ratio of 18.72 per 1,000; Toronto, 2,873, a ratio of 15.68 per 1,000; Chicago, 21,809, a ratio of 13.46 per 1,000.

The increase of births over deaths depends on two chief factors; either an increase of the birthrate or a decrease of the death rate. The following table makes a comparison between births and deaths in these cities during 1897, with the natural increase:

City.	Population.	Increase of Births over Deaths.	Percentage of Increase.
Montreal.....	262,100	1,911	.0072
Toronto.....	183,172	1,263	.0065
Philadelphia.....	1,214,256	7,216	.0059
Chicago.....	1,619,226	6,349	.0039

The highest of these percentages, that of Montreal, is a trifle under three quarters of one per cent. Now, according to the estimated rate given in the annual report of the Registrar-General for England and Wales, the natural increase for that country for 1890 is 1½ per cent., and the report for 1891 states, that the same rate was maintained for that year. The natural increase in these cities is, therefore, small. Yet the effect of an immense birth rate is apparent when we see that Montreal, in spite of a large mortality, is able to show a greater increase than Toronto. Similarly Philadelphia, in spite of a relatively large death rate, shows a larger increase than Chicago.

During the year 1897, notable epidemics of preventable diseases did not prevail in these cities. Philadelphia had a mortality of 401 from typhoid fever; in Chicago, typhoid fever caused a mortality of 437, against 751 in 1896, an immense decrease. In contagious diseases, scarlatina caused a mortality of 66 in Toronto, and small-pox a mortality of 12 in Montreal. Moreover, the annual death rate of Philadelphia, 18.72 was, for a large city, quite normal; that of Toronto, 15.68, was also satisfactory.

Under these circumstances, the low death rate of Chicago and the high death rate of Montreal demand some explanation. An authority (Rohé) states, that in a large city, such as Chicago, a death rate of 13.46 "would indicate that all the deaths had not been recorded, or that the population had been over-estimated; rates above would be evidence, that there were special causes at work demanding sanitary investigation and improvement." Without undertaking to dispute these assertions, it may be well to point out that the Chicago Department of Health, which in 1897 was carried on at an expense of \$213,560, maintains a special bureau of vital statistics, and certainly ought to be informed of every death which occurs in that city. The statistical population figure used is the official school census declared July 1st, 1896. In Chicago, moreover, the proportion of adults to children is, probably, greater than the normal, and the death rate is naturally lower. Besides, great efforts are being made in that city to put down disease and promote good health, so that owing to the social condition of many of the people, and civic sanitary improvements as well, a low mortality is quite conceivable.

A survey of the diseases, which produce the large mortality of Montreal does not reveal many causes demanding special sanitary investigation. In 1897, there was an outbreak of small-pox, which caused twelve deaths, and the death rate from other zymotic diseases, is not high. The following table shows the typhoid fever mortality of the four ties, with the ratio per 100,000 of population:

	Deaths from typhoid fever.	Ratio per 100,000.
1897. Toronto.....	20	16.37
Chicago.....	437	26.98
Montreal.....	80	30.52
Philadelphia.....	401	33.02

Here, we may admit that the Montreal ratio assimilates too closely to that of Philadelphia to be reassuring. It may be, therefore, that the Montreal water works demand sanitary investigation and improvement, or the large typhoid mortality may be explained in a different way. In order to show the mortality from zymotic diseases, whose incidence falls most on children, in a city with a high mortality, compared with a city having a low mortality, the following table is submitted:

1897. Montreal—Deaths from variola.....	12
“ “ mumps.....	00
“ “ measles.....	63
“ “ scarlatina.....	17
“ “ whooping-cough.....	95
“ “ diphtheria and croup.....	251
	<hr/> 438

Or 6.3 per cent. of the total mortality.

1897. Chicago—Deaths from variola.....	00
“ “ mumps.....	4
“ “ measles.....	139
“ “ scarlatina.....	81
“ “ whooping-cough.....	160
“ “ diphtheria and croup.....	772
	<hr/> 1,156

Or 5.3 per cent. of the total mortality.

Here, an advantage of 1 per cent., on the side of Chicago, shows, that measures for the suppression of contagious diseases were more successfully carried out in Chicago, than in Montreal. It is only fair to say, however, that in Montreal, on account of a high birth rate, there are more candidates for contagious diseases, and, consequently, greater difficulty is experienced in checking outbreaks of these diseases than in Chicago. Some other factor than insanitary conditions seems, therefore, necessary to explain the high

death rate of Montreal. It seems to be due to a large mortality among infants and young children, particularly the former. For instance, the deaths of children under five years of age in Philadelphia were 7,605, or 33 per cent. of the total mortality. In Toronto, the deaths of children under five years of age were 998, or 34.73 per cent. of the total mortality. In Chicago, the deaths of children under five years of age were 8,546, or 39 per cent. of the total mortality. In Montreal, the deaths of children under five years of age were 3,273, or 47.16 per cent. of the annual mortality. In Montreal the loss of infantile life appears to be excessive. The actual figures are:

1897. Montreal—Total mortality.....	6,939
Deaths under one year.....	2,306—33.23%
Deaths from one to five years.....	967—13.93%
	<hr/>
	3,273 or 47.16%
1897. Chicago—Total mortality.....	21,809
Deaths under one year.....	5,735—26.29%
Deaths from one to five years.....	2,811—12.88%
	<hr/>
	8,546 or 39.17%

The mortality rate for children from one to five years of age is better, by over 1 per cent., in Chicago than in Montreal; but the great divergence appears when we compare the respective mortality rates of children, under one year of age. Under this head, Montreal has a mortality of 6.94 per cent. larger than that of Chicago. This does not mean that infantile life is more carefully preserved in Chicago, than in Montreal. The death rate among infants bears a relation to the birth rate; in cities where the birth rate is high, the infantile death rate is high, and where it is low, the infantile death rate is low.

Among the causes that make the mortality among infants and children high are: Parents too young or sickly, hereditary taints, unhealthy environments, improper and insufficient food and clothing. It is, simply the manifestation of the workings of the law of the "survival of the fittest." As evidence of the soundness of this view, we may say, that in Montreal, 658 deaths were due to congenital debility, 129 to infantile convulsions, 310, a large number of which were in children, to simple meningitis, and 1,396, the greatest number of which were probably in infants and children, to diarrhoea and gastro-enteritis, which was the highest single factor in the death rate of Montreal. If to these we add the number of infants and young children, who perished from zymotic diseases, we can see how the large mortality is produced. When contagious disease appears in Montreal, it is all the more necessary for the health authorities to exert themselves and enforce good hygiene in the domicile and the school, so that though the congenitally weak may perish, the largest number of those, who are fit and strong, may be spared to reach adult age.

REPORT OF THE COMMITTEE ON VENTILATION.

By J. J. CASSIDY, M.D.

TORONTO, January 31st, 1899.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—On Monday, January 16th, your committee tested the heating and ventilation of the Public and High Schools of Caledonia, which are included under one roof. The plan and specifications of this system of ventilation are herewith submitted. Or, this system may be thus described ; a cowl in a turret at the roof, revolves with the wind, and catching air from whatever quarter the wind blows, delivers it through inlets into the rooms to be ventilated. The incoming air may be heated in winter by a stove, hot water coils or a furnace. After distribution the air is removed through heated outlets at the floor level, which cause it to ascend and escape in the turret, in a direction contrary to the wind. Suggestions are offered in Mr. Shantz's report, about purifying the incoming air by filtration and for cooling the air in summer. The combined outlet pipes may be heated by the smoke stack of the furnace. At Caledonia, as stoves are used, the stovepipes enter flues in the walls in the ordinary way, but they serve to heat the initial portion of the outlet in each room and help to create a current of air. The fresh air descends into each room, enters an area surrounding the sides and the bottom of a box-stove and escapes into the room. The tests applied are herewith submitted :

REPORT OF VENTILATION OF PUBLIC SCHOOL AT CALEDONIA.

Date, January 16th, 1899.

660 feet above sea level.

Weather, fair and mild ; wind, south by west.

Temperature, 42° F. ; humidity, 73% ; barometer, 29.10 inches.

Room No 1 ; floor, 1st ; side, north-east.

Seating capacity, 50.

Persons present, 25.

Net air space, 9750 cubic feet.

Air space per cap., 390 cubic feet.

Temp. at teacher's desk, 64.° F.

Humidity, $\left\{ \begin{array}{cc} \text{D.B.} & \text{W.B.} \\ 73^{\circ} & 63^{\circ} \text{ F.} \end{array} \right\} 54\%$

Different temperature in different parts of room at breathing line, 71-64°=7° diff.

Temperature of air at inlet, 98° F.

Fresh air per minute, 146 cubic feet.

Air removed at outlet per minute, 306 cubic feet.

Amount of air supplied per cap. per minute, 5.84 cubic feet.

Air of room changed 1.9 times per hour.

Carbonic acid in 1,000 parts of air, 1.025 (3rd filling); pure air out doors, 12 fillings

Time of test, 10.35 a.m.

REPORT OF VENTILATION OF HIGH SCHOOL.

Date, January 16th, 1899.

Weather, fair and mild ; wind south by west.

Temperature, 43° F. ; Humidity, 75% ; Barometer, 29.05 inches.

Room No 1, ground floor, west side.

Seating capacity, 62.

Persons present, 37.

Net air space, 9,000 cubic feet.

Air space per cap., 240.32 cubic feet.

Temperature at teacher's desk, 61° F.

Humidity, D. 61° F., W. 53° F.=60%.

Difference in temperature in different parts of room at breathing line, 61.65° F.=4° F. average difference.

Temperature of air at inlet, 75°.

Fresh air per minute, 118.3 cubic feet.

Air removed at outlet per minute, 232.050 cubic feet.

Amount of air supplied per cap. per minute, 3.20 cubic feet.

Air of room changed=1.54 times per hour.

Carbonic acid in 1,000 parts of air, 1.230 (air close).

Time of test, 2.45 p.m.

In Public School room 1, first floor, the cubic air space per capita, 390 feet, was rather large, but this was due to a small attendance, twenty-five instead of fifty pupils. The temperature ranging from 71° to 64°, showing a difference of 7°, indicated a rather uneven distribution of warmed air. The humidity, fifty-four per cent., was good, especially when compared with the humidity of air supplied by a hot air furnace, which commonly supplies air having a humidity of forty-two to forty-five per cent.

The quantity of fresh air supplied per minute, 146 cubic feet, or 5.84 cubic feet per capita was very small, the standard being thirty cubic feet per capita per minute.

The air of the room was changed in 1.9 times per hour for twenty-five pupils, it should have been changed 4.61 times. The air was rather close, containing carbon dioxide 1.025 per 1,000 vols. In High School, room 1, ground floor, the net air space, 240.32 cubic feet, was less, the number of persons present being greater and the room a trifle smaller. The small difference, 4°, between the highest and lowest recorded temperatures showed an even diffusion of warm air. The humidity, sixty per cent., was favorable. As in the other room, the amount of fresh air admitted was small, the amount supplied per capita per minute, viz., 3.20 cubic feet, being about ten times less than the full amount. The air of the room was changed in 1.54 times per hour, when it should have been changed in 7.4 times per hour. The air was close, the carbon dioxide being 1.230 in 1,000 volumes of air. It was necessary to open the windows to let in fresh air.

The system provides an equable flow of warmed air through a room. In order to produce standard effects as a system of ventilation, it would be necessary to make the inlets large enough to admit the required amount of fresh air and the outlets wide enough to remove a corresponding amount of foul air, and to produce the necessary rapidity of movement fans would be required.

Mr. Shantz informed me that his system would work better on a windy day. He also proposed making certain changes in his system in order to make it more effective.

Mr. Tracy's heating drum and ventilator is an apparatus which may be described as follows: A sheet-iron drum 28½x13 inches, placed above an ordinary base-burner stove, so that the smoke pipe of the stove passes through the centre of the drum; an outlet pipe 2½ inches in diameter, starting from a point two inches above the floor, ascends and perforating the lower surface of the drum discharges air drawn from the floor level directly into the common smoke pipe. A fresh air inlet, 3½ inches in diameter, starting outside the house wall, discharges warmed air into the room. This system was tested by Dr. Bryce as to the temperatures obtained in different parts of the room and also the inflow and outflow of air.

December, 13, 1898, 3 p.m.—Outdoor temp., zero; room, ground floor, south-east corner Yonge and Shuter streets. Capacity, 56,700 cubic feet. This space was heated by a base-burner coal stove, to which a Tracy drum was attached. The following temperatures were taken:

Temperature: 6 feet from stove, 5 feet above floor, 48° F.

Temperature: 25 feet from stove, at ceiling, 48° F.

Temperature: 80 feet from stove, 7 feet above floor, 46° F.

Temperature : 22 feet from stove, on floor under north window, 40° F.

Temperature : 40 feet from stove, on floor under north window, 40° ; on floor near foul air outlet, 48° F.

Temperature : 40 feet from stove, to north-east 2 feet from floor at window, 40° F.

Temperature ; 60 feet east of stove, 2 feet from floor, 40° F.

Temperature : 6 feet east of stove, 2 feet from floor, 45° F.

Temperature : 40 feet to east of stove, 5 feet from floor, 43° F.

Temperature : 45 feet to east of stove, 5 feet from floor at a window, 43° F.

Temperature : 5 feet from stove, 5 feet from floor, 47° F.

Temperature of fresh air at inlet, over, 150° F.

December 14th, the extraction of foul air was measured and was found to be 17.18 cubic feet per minute or 1,030.83 cubic feet per hour.

The air space would be changed in fifty-five hours.

The fresh air inlet delivered 15.46 cubic feet per minute or 927.75 cubic feet per hour.

We thus see that the small quantity of fresh, warm air introduced by this system into the room, viz., 927 cubic feet, is almost equal in amount to the quantity removed at the outlet, viz., 1030 cubic feet. The slow, equable inflow and outflow secures an even diffusion of the air heated by the stove in all parts of the room as shown by the recorded temperatures given above.

This system deserves favorable notice as a simple and efficient method of causing the air, heated by a common stove, to circulate freely throughout all parts of a room, the lower levels of a room being maintained at about the same temperature as the space near the ceiling. It is suited for the moderate heating of a relatively large air space, in which it is desirable to obtain the required heating of the air with one stove. It is not a system of ventilation, because the quantity of fresh air introduced is very small, but ventilation or the inflow and outflow of air are dexterously employed to provide for the equable diffusion of warmed air.

Your committee has also received a paper and a sketch from Mr. J. Dearness, County School Inspector, London, Ont., describing a system of heating and ventilation used in several schools in that portion of the Province. This system in brief provides for the introduction of pure air into a drum fitted on the end of a large box-stove, where, being heated, it is distributed in the school room. The foul air is removed at the floor level by flues, ascending from the floor, a current being created in them by the heated smoke-stack of the stove, which runs through the common terminal foul air outlet and afterwards penetrates through the roof.

This system is said to have produced good results in heating the buildings in which it is used and with a saving in the matter of fuel.

Not having tested the ventilation in any of the schools, heated by this system, your committee cannot express an opinion as to its merits as a system of ventilating a school room.

PART III.



BELLEVILLE.

REPORT OF THE MEDICAL HEALTH OFFICER.

Nov. 1st, 1898.

To the Chairman and Members of the Local Board of Health :

GENTLEMEN,—I have the honor to present the following report for the year ending 30th November, 1898 :

The mortality for the past year was 137. Of these three died from typhoid fever which was contracted out of the city, fifteen cases of phthisis from city and county, twenty-one cases of pneumonia, four cases of cancer, three still-births, four cases of appendicitis ; there has not been a death from either scarlet fever, measles, whooping cough or diphtheria during the year.

The Inspector made his usual house to house inspection of the city and found the citizens willing and anxious to respond to the requirements in the way of cleaning up yards and privies. We are gradually closing up privy pits and adopting dry earth closets, and in time hope to see all pits abolished. The wells also were inspected and analysis of samples of water sent to Toronto, and any well found to be dangerous was ordered to be filled up. The city council is gradually extending the system of sewers, and I trust that in a few years Belleville will have a complete system of sewerage which will no doubt improve the city in a sanitary way. The Inspector has looked carefully after any complaints forwarded him by me, something over sixty during the year, and placarded any house with infectious diseases. The market square and street near it have been kept clean and free from any garbage, after each market being thoroughly swept and all refuse carted away. We have one slaughter house in the city which has been kept clean and no refuse matter allowed to remain on the premises twenty-four hours. We have had a few sporadic cases of scarlet fever, in each case the house was placarded and disinfection in the way of sulphur fumigation, so that in no case was the fever allowed to extend.

I have the honor to be,

Your obedient servant,

R. TRACY, M.D.,

Medical Health Officer.

BELLEVILLE, November 1st, 1898.

BRANTFORD.

REPORT OF THE MEDICAL HEALTH OFFICER.

Nov. 11, 1898.

To the Chairman and Members of Brantford Board of Health :

GENTLEMEN,—I herein beg to submit to you the annual report of the sanitary condition of the city for the year ending October 31, 1898.

Mortuary statistics.—The total number of deaths for the period comprised in this report has been 204, which in a population of 18,000, gives a death rate of 11.33 in 1,000, and as compared with previous years is a very satisfactory showing. The death rate per thousand in 1893 was 13.83 ; in 1894, 13.03 ; in 1895, 15.56 ; in 1896, 13.88 ; in 1897, 15.01. As to causes of death there was from typhoid fever, 7 ; diphtheria and croup, 3 ; pneumonia, 17 ; phthisis, 16 ; diarrhoea and cholera inf., 11 ; other causes, 150.

Of these there were under one year 41 ; under five years 52 ; over sixty years, 58 ; and over eighty years, eight.

Contagious diseases.—Of this or the so-called preventable class of diseases, there has occurred in the city during the past twelve months a total of 130 cases, or a decrease of 19 from the preceding year. The following table will give the monthly rate and mortality of each disease :

Month.	Typhoid fever.		Scarlet fever.		Diph. and croup.		Measles.		Unclassified.	
	cases	deaths.	cases.	deaths.	cases.	deaths.	cases.	deaths.	cases.	deaths.
November.....	3	2	2	0	4	0	0	0	0	0
December.....	2	0	3	0	6	1	0	0	0	0
January.....	3	1	1	0	5	1	2	0	0	0
February.....	0	0	1	0	3	0	0	0	6	0
March.....	0	0	1	0	1	0	0	0	0	0
April.....	1	1	0	0	1	0	0	0	0	0
May.....	0	1	0	0	0	0	0	0	0	0
June.....	0	0	11	0	4	0	0	0	0	0
July.....	3	0	9	0	1	1	0	0	0	0
August.....	5	1	4	0	1	0	0	0	0	0
September.....	9	0	2	0	2	0	0	0	1	1
October.....	18	2	9	0	4	0	0	0	0	0
	44	7	44	0	32	3	2	0	7	1

Total cases, 130, and deaths, 12.

Typhoid fever.—During the past sanitary year there developed in the city 44 cases of typhoid fever, with the rather high mortality of 7, as compared with 31 cases and 4 deaths in 1897, and 55 cases with 5 deaths in 1896. Most of the cases have been confined to the eastern and northern portion of ward IV., where the water supply is principally from wells, the common source of which is springs in the low flat part of the ward and which at the same time receive a great part of the drainage from that part of the city. As seen from the above monthly record the greatest number of cases occurred during September and October, after the summer drought when the wells are at the worst. As the cause of typhoid fever is generally directly or indirectly attributable to the water supply, it has this year as in previous ones, been shown that the consumers of well water are more frequently infected than those who are users of the public water supply, since out of the above 44 cases, 35 were well water users, five both city and well, and four city water users.

Again, we find that in the most thickly populated parts of the city, where once typhoid was prevalent, since the abolition of the wells and replacing them with the public supply, typhoid is of rare occurrence. Thus the gradual extension of this process along with an efficient sewerage system in these infected regions will soon reduce the number of cases to a minimum.

Scarlet fever.—Of this disease, 44 cases with no fatalities, were reported during the year, and although the cases were of a mild type, there is more to be feared from the spreading of this than any of the other contagious diseases, from the fact that a mild case often goes unnoticed, no physician being called in. The child going to school becomes a source of general infection, and since the period of infection exists long after the patient is well and able to be about, it is practically impossible to enforce the required isolation outside a proper hospital; and more particularly is this the case in large families or such places as the children's aid home (where some 17 children are hived together) and from which institution we feared the development of a general outbreak during the last month from an infected child from these attending school, and which undoubtedly proved the source of a number of cases in that locality outside the five we were fortunate in restricting the number to within the home. Of other cases occurring in the city, ten were apparently due to the accidental infection of a milk supply through the bottles. This matter was speedily remedied and no further developments from that source occurred; other seven cases were directly traceable to direct infection from children playing together during the period of desquamation, which is the most infective period.

Diphtheria and Croup.—During the last year there were reported of the above 32 cases with three deaths, as compared with 42 cases and ten deaths in 1897. Of these four cases with one death occurred in houses previously infected.

Two of the public institutions have been visited by this disease during the year; the institution for the blind, where through the efficient mode of isolation, etc., but three cases developed; and the young ladies' college where one case occurred, but being promptly removed from the buildings no other cases developed. Both the above places received the infection from outside

the city by the return of pupils after the summer vacation. It is with diphtheria that we have been called upon twice during the year to deal with in the way of removal and isolation in different parts of the city, both cases being imported from the outside. Although the disease was prevented from spreading, yet at the same time it was the source of much trouble and annoyance, for to procure the necessary accommodation is next to impossible.

Isolation Hospital.—I wish once more to call the attention of this board and to solicit their prompt action towards the establishment of such an institution, the need of which this city with its increasing population seriously feels, and which to cope successfully with contagious diseases, we must have.

Measles.—This year we have had but two cases, with no deaths, as to 36 cases and two deaths last year.

Of other contagious diseases unclassified in the above there has been seven, with one death, that being from whooping cough.

Public Water Supply.—In this matter of public water supply, which affects to a very great extent the health of a community, we as a city are very fortunate, for not only is there a marked absence of such diseases as typhoid fever in those who use the city supply as compared with the users of well water, but the frequent tests of the Provincial Bacteriologist show the universal good quality of the city supply. For example, I give the last report taken from samples sent during the middle of September, when, if at any time, the report should be the most unfavorable. The results are as follows :

Health Office tap	Bacteria per cc.	20	
Victoria Park tap.....	"	32	
Alexandria Park.....	"	50	
Mohawk Institute well No. 1.....	"	580	
" 2.....	"	1,970	Suspicious.
" 3.....	"	350	
G. Hull's well, 208 William St.....	"	21,960	Very bad.
— Duncan's well, 133 Park Ave.	"	590	
— Bier's well, 216 Park Ave.....	"	2,340	Suspicious.
— Yeates' tap (dead end), 227 Chatham St.	"	170	
Dr. Digby's well, Market St.....	"	930	

In the matter of dead ends I would recommend that the goose necks used for filling the watering carts be placed on them where possible, and where this cannot be done some means such as a hydrant be adopted to draw off the water from them at least twice a week.

Milk Supply.—Regarding this article of food, which enters to so great an extent in its raw state into the diet of a community, a close watch has been kept over the dairies by periodic inspections and the supply itself by frequent tests. But since milk often forms a good nidus for the development of bacteria, and forms thereby a possible source of infection, too much care cannot be urged on the milkmen, and where bottles are used they should be subjected to sterilization.

Again, as regards the possibility of tuberculosis in cattle being transmitted through milk having been established, the action of this board is to be commended on the stand it has taken in the enforcement upon all milkmen who supply this city the necessity of having their herds and those from which they obtain supplies subjected to the tuberculin test as provided free by the Dominion Government through their veterinary inspectors, and granting permits to only those who can produce from such veterinary inspectors a clean bill of health of his herds, etc.

Sanitary Inspector's Report.—During the year 150 complaints have been filed at this office, all of which have been investigated and satisfactorily disposed of. Besides the above and inspections of premises where there occurred contagious diseases, there have been 200 house to house inspections. There has also been a thorough inspection of all hotels in the city.

All the thirty-two dairies supplying the city have undergone inspection—once in November and December, 1897, and parts of them again in March and July, 1898. The conditions show a marked improvement in the matter of light, ventilation, drainage and general cleanliness of both cattle and byres.

There have been made from time to time milk tests, the results in a number of cases not being as satisfactory as they should, and the milkmen have been notified to get up to the proper standard or forfeit their permits.

The dairymen have been notified *re* the tuberculin test of herds to be made by Government Veterinary Inspectors, as passed by the board at its meeting in September.

There have been fifty sewer connections made during the year.

There has been a number of water samples collected from time to time during the year to be sent to the Provincial Bacteriologist for examination.

There has been a great many books, etc., from the free library, schools, etc., sterilized from homes where there had been contagious diseases.

In the most of cases where contagious diseases existed, especially diphtheria and scarlet fever, placards have been put up, disinfectants supplied and disinfection done under the supervision and direction of the sanitary inspector.

Fifty privy pits have been cleaned, abolished and replaced by dry earth closets or sewer connection.

There have been issued twenty-five general nuisance notices not included in the above.

(Signed)

J. T. WALLACE,

Sanitary Inspector.

In conclusion I have to regret that other matters have prevented the council from as yet taking any action on the recommendation of this board for a general garbage system, but hope in the near future it, along with the much needed isolation hospital, will be added to the city.

F. G. E. PEARSON,

Medical Health Officer.

N.B.—Since writing this report two new cases of diphtheria have developed at the Institution for the Blind. The rest of the inmates are being subjected to inoculation with antitoxin.

F. G. E. P.

CHATHAM.

REPORT OF MEDICAL HEALTH OFFICER.

November 15th, 1899.

To the Chairman and Members of the Chatham Local Board of Health :

GENTLEMEN,—I herewith submit to you my annual report extending from December 1st, 1897, to December 1st, 1898 :

Contagious Diseases.—The following cases of contagious diseases were reported :

	Cases.	Deaths.
Scarlatina	9	none
Diphtheria	29	1
Typhoid Fever	61	1
Tuberculosis	not reported	9

Smallpox.—On September 18th a telegram from the Medical Health Officer of Detroit was received, stating that a veiled woman suspected of having or being exposed to smallpox had escaped their quarantine and started for Chatham.

The woman was located in a Queen street home in a family of four grown-up people and one child. It was found that she was in the seventh or eighth week of the disease, and many of the points of eruption were still covered with scabs, hers being probably the first case carried from Put-in-Bay to Detroit and not discovered by the authorities until the day of her escape here after having infected a number of persons.

The house and individuals in it were promptly quarantined ; the inmates were vaccinated, as well as all others whom we thought might have been exposed. The quarantine was continued for sixteen days. During this time the house was constantly watched night and day by a relay of watchmen and all supplies brought to them. The total extra expense to the municipality in this case was \$95.78.

Scarlet Fever.—There were four distinct outbreaks of this disease in a mild form. Prompt and careful isolation prevented its spread. Total number of cases, nine, with no deaths.

Diphtheria.—There were seven distinct outbreaks of this disease with a total number of cases of twenty-nine with one death. Twenty-three were treated at contagious disease hospitals; six at home. The almost universal use of diphtheria anti-toxin has robbed this disease of much of its terrors. The profession and public now realize that when it is used early and in sufficient quantity the danger from the disease is very much reduced. The excellent work accomplished in the contagious wards of St. Joseph's and General Hospitals has not only done much to prevent the spread and accomplish the cure of scarlet fever and diphtheria in this municipality but in all those contiguous to it. The total number treated in these wards were forty-two, with three deaths.

Typhoid Fever.—Sixty-one cases of typhoid fever were reported, with one death. Fifty-one of these habitually used well water only. Eight were attributed to sewer or other ground contamination. In two others the cause was uncertain.

It is gratifying to notice that for the last few years the disease is decreasing, and there is no fact more plainly brought out in our annual reports than that the improvement is owing to the increased number of persons using the city water supply. The number of householders using city water at present is 977. Our city water works is no longer an experiment but a permanent institution. The water is of excellent quality, abundant in quantity, and reasonable in price. There is no longer any excuse for citizens living on streets where water mains are laid, to use well water, which at best is only soakage water of very uncertain quality and questionable origin.

Consumption.—As this disease is not yet reported as a contagious disease it is impossible to make a report as to the number of cases, but a total of nine deaths has been reported for the year.

Total Mortality.—Total number of deaths from all causes, 159. This includes ten stillbirths.

Death Rate.—16 to 1,000 or 1.6 per cent.

Sewers.—A number of new sewers have been constructed or are now under way. Five thousand eight hundred feet were ordered by this board as sanitary improvements under the by-law, and 6,799 feet were regularly petitioned for, making a total of 12,599 feet, ranging in size from ten to twenty inches, an average of about fifteen inches.

All of which is respectfully submitted.

WM. R. HALL,

Medical Health Officer.

HAMILTON.

REPORT OF MEDICAL HEALTH OFFICER.

November 15th, 1898.

To the Chairman and Members of the Local Board of Health :

GENTLEMEN,—I beg to report on the sanitary condition of the city for the year ending 31st October, 1896, as follows :

Death Roll.—During the year 734 deaths were recorded, of this number twenty-five were non-residents, which are not included in our mortality. Six citizens died while absent from the city and are included. Our citizen mortality was 709. Taking the population at 51,011 (as given by our assessors) the death rate per 1,000 was 13.87. The previous year gave a death-rate of 11.85, which was exceptionally low.

Deaths from accident number nineteen, of which four were non-residents. There were five cases of suicide, same number as last year. Seven deaths occurred at the House of Refuge, two at Aged Woman's Home (one due to accident), eight died at Home of the Friendless and two at the Jail (one a non-resident hailing from Beverly).

Deaths of children under one year old, 158. One year and under five number 57. Total under five years, 215.

Rate of ward mortality per 1,000 of the population shows—ward one, 11.73; ward two, 15.08; ward three, 11.93; ward four, 14.45; ward five, 16.67; ward six, 13.45; ward seven, 13.99. Wards two and five showing a marked preponderance over the other wards. The pop-

ulation of ward two was 5,832, with eighty-eight deaths, and ward five, 6,416, with 107 deaths. All cases dying in our hospitals are recorded in the wards where they resided previous to admittance.

Contagious Diseases.—The number of contagious diseases have not been very alarming. There were 162 cases of diphtheria reported, which shows a rate of 3.17 per 1,000 of the population were reported, with twenty deaths. Last year only 62 cases were reported with fourteen deaths, whereas this year we have 100 cases more with only twenty deaths. Some physicians might impute this to the use of anti-toxin, but I attribute it to the mildness of the cases, some of which were of doubtful diagnosis. Scarlet fever cases reported were 214, giving a rate of 4.10 per 1,000, with ten deaths. Thirty-seven cases of typhoid fever, or .72 per 1,000 of the population were reported, with six deaths.

The other contagious diseases reported were thirty-five cases of whooping cough, with two deaths (thirty of these cases occurred at the Boy's Home), twenty-three cases of measles, eighty-six cases of chicken pox and eight cases of mumps.

Totals of all contagious diseases number 565, showing a rate of 11.07 per 1,000 of the population.

Garbage.—Dumping grounds no doubt contain the elements of disease and in my opinion it would be advisable to have them covered over as quickly as possible. Indeed the proper thing to do would be to make ground as the work proceeds, instead of scattering the refuse, etc., over a large area.

All flesh and vegetable matter and clothing should be destroyed by cremation; they contribute only in a small degree towards making ground.

An incinerator is a necessity.

Milk Inspection.—I would earnestly direct the attention of your Board to the necessity of having the milk by-law amended. I refer particularly to the latter part of rule 11, referring to giving duplicate samples, which is quite unnecessary, as the Dominion Act sufficiently guards the interests of the milk dealers. The clause is now used as a pretext for not supplying samples in accordance to rule X. Other amendments might also be made in the interests of our citizens.

A few days ago the Dominion inspector was in this city; in company with our milk inspector he visited several cow byres in the county. He gave due praise to some of them while others were stated to be simply abominable. This state of affairs should be rectified by proper inspection. It would seem that inspections made by county officials cannot be depended on.

The inspectors annual statement is appended, as also the usual forms.

Respectfully submitted,

(Sgd.) I. RYALL,
Medical Health Officer.

Hamilton, Ont.,
15th Nov., 1898.

CITY HALL, HAMILTON, November 19th, 1898.

TO DR. RYALL,
Medical Health Officer.

DEAR SIR,—Below please find summary of work by milk inspector from November 1st, 1897, to 31st October, 1898, inclusive:

Number of milk licenses issued, good to April 30th, 1898	206
Samples collected and tested	414
Dairies inspected	193
Cow byres	168
Shops	160
Cows reported in a dirty condition and notified to clean	5
Yards dirty and notified to clean	3
Cow byres dirty and notified to clean	1

Respectfully submitted,

(Signed) L. O. MACDONALD,
Inspector.

CITY HALL, HAMILTON, November 7th, 1896.

To DR. RYALL,

Medical Health Officer.

SIR,—Below please find summary of work done by your three inspectors for the year commencing November 1st, 1897, and ending October 31st, 1898, all of which is duly recorded.

Number of inspections made	7,758
“ privy vaults cleaned out by contractors	1,573
“ “ permits given for new ones	31
“ “ abolished	71
“ cesspools cleaned by contractors	24
“ “ permits given for new ones	8
“ dry earth closets notified to be cleaned	50
“ sewer connections notified to be made	17
“ “ found defective and repaired	123
“ foul drains abolished	35
“ stagnant water abolished	25
“ dirty premises cleaned	25
“ other nuisances abated	753
“ old wells filled in	2
“ houses placarded for infectious diseases	260
“ “ fumigated	269
“ loads of refuse delivered at the dump by scavengers	7,504
“ “ from hospital burnt at crematory	54
“ parcels, bedding, etc., from infected houses burnt at crematory	13
“ dead animals collected and buried by D. McBride—dogs, 194; cats, 82; fowls, 33	309

(Signed) J. PEACOCK,

Inspector.

Hamilton Contagious Disease Report for 1897-98.

Month.	Diphtheria.		Scarlet fever.		Typhoid fever.		Measles.	Chicken pox.	Whooping cough.	Mumps.
	Cases	Deaths.	Cases	Deaths.	Cases.	Deaths.				
November	17	2	9	1	2	1	17	17	1	1
December	14	2	5	1	11	1	16	16	1	1
January	24	3	14	1	2	1	1	17	1	1
February	6	2	33	1	2	1	1	13	1	1
March	10	1	39	2	4	1	3	3	1	1
April	4	1	18	1	1	1	1	2	1	1
May	6	1	34	2	1	1	4	3	4	2
June	27	5	9	1	1	1	5	8	3	3
July	17	3	16	3	1	1	8	2	30	1
August	7	1	9	1	4	1	2	2	1	1
September	6	1	16	1	6	1	1	2	1	1
October	24	2	12	1	3	2	3	3	1	1
Totals	162	20	214	10	37	6	23	86	35	8

Diphtheria, Scarlet Fever, Typhoid Fever.

	1	2	3	4	5	6	7	By wards.
Diphtheria	12	4	6	21	34	58	27	162
Scarlet fever	5	25	26	38	24	51	45	214
Typhoid fever	2	7	3	5	2	7	11	37
Totals	19	36	35	64	60	116	83	413

Hamilton Mortuary Statistics of Residents for year 1897-98.

Year 1897-98.	Total burials Hamilton cemetery.			Hamilton cemetery.			Holy sepulchre.			Still born.	Other burial grounds of all denominations.			Total city mortality of all denominations.			Still born all denominations.
Monthly statement.	Totals.	non- resident.	Still born.	Citizens.	Males.	Females.	Citizens.	Males.	Females.		Citizens.	Males.	Females.	Citizens.	Males.	Females.	
November	43	4	6	33	17	16	7	2	5	....	9	6	3	49	22	27	6
December	58	13	5	40	22	18	12	7	5	....	6	5	1	58	34	24	5
January	59	4	3	52	26	26	11	6	5	....	5	3	2	68	35	33	3
February	46	6	4	36	12	24	11	4	7	....	8	3	5	55	19	36	4
March	62	13	4	45	23	22	22	9	13	1	5	2	3	72	34	38	5
April	75	12	4	59	34	25	10	5	5	....	9	5	4	76	44	34	4
May	47	8	5	34	18	16	6	3	3	....	12	7	5	52	28	24	5
June	55	9	2	44	23	21	8	4	4	1	10	5	5	62	32	30	3
July	47	7	4	36	16	20	8	4	4	....	4	1	3	48	21	27	4
August	48	10	3	35	15	20	10	5	5	....	4	3	1	49	23	26	3
September	53	10	3	40	20	20	12	4	8	1	12	5	7	64	29	35	4
October	47	11	....	36	18	18	14	10	4	1	4	1	3	54	29	25	1
Totals.....	640	107	43	490	244	246	131	63	68	4	87	43	44	709	350	359	47

Deaths by Wards and Months.

—	1	2	3	4	5	6	7	Total.	Population and death rate per 1,000.	
November	2	7	7	13	5	6	9	49	1—4,772	11.73
December	3	6	7	7	9	14	12	58	2—5,832	15.08
January	10	11	10	7	11	9	10	68	3—8,179	11.93
February	5	10	3	16	8	7	6	55	4—7,658	14.45
March	3	7	8	10	15	15	14	72	5—6,416	16.67
April	7	7	16	14	11	9	14	78	6—9,367	13.45
May	4	8	6	4	9	12	9	52	7—8,787	13.99
June	2	13	9	5	11	15	7	62		
July	3	4	7	5	8	8	13	48		97.30
August	4	4	6	11	6	10	8	49		
September	7	8	9	11	7	9	13	64		
October	6	3	10	8	7	12	8	54		
Totals.....	56	88	98	111	107	126	123	709	Average.....	13.90

KINGSTON.

REPORT OF THE MEDICAL HEALTH OFFICER.

December 31st, 1898.

To the Chairman and Members of the Local Board of Health :

GENTLEMEN,—I beg to submit the annual report of the sanitary condition of the city, for the year 1898.

Report of Contagious and Infectious Diseases reported.

	Typhoid fever.	Diph- theria.	Scarlet fever.	Whooping cough.	Mem. croup.
January	1	3	1		
February		7			1
March					
April	1	1			
May		4			
June		3	1		
July	1	1			
August	1	1			
September	3				
October		2			
November	3	9			1
December		8			
Total	10	39	2		2

Sanitary Inspections.—The following is a summary of the sanitary work performed during the year :—

Number of permits issued to clean privy vaults	564
Number of cubic feet night soil removed from	21,000
Number of privy vaults filled up with fresh earth	17
Number of privy vaults shallowed to 2½ feet deep	19
Number of privy vaults inspected during the year	2,749
Number of privy vaults reported clean	2,404
Number of privy vaults reported dirty	345
Number of yards and premises inspected during the year	3,881
Number of yards and premises reported clean	3,684
Number of yards and premises reported dirty	197
Number of cellars inspected during the year	2,978
Number of cellars reported clean	2,893
Number of cellars reported dirty	14
Number of cellars reported damp	71
Number of water closets reported in use	832
Number of dry-earth closets inspected	452
Number of dead animals removed from streets, etc	107

Ice.—The ice supply is regulated by provisions laid down by the Local Board of Health. That for domestic purposes is required to be cut in deep water 1,200 from shore, where it is free from sewerage or any other impurity likely to contaminate. For cooling purposes only ice may be obtained in any other section, on permission direct from the Board itself.

All places of storage used, or intended to be used, for domestic or cooling purposes, within the municipality, are subject to inspection by the Medical Health Officer or Sanitary Inspector, and must be clean, wholesome and properly drained and ventilated.

Milk Supply.—The milk supply is at present derived from sixty-three dairies, containing 665 milch cows. Every one of these dairies has been inspected during the year, with regard to the health, food and water supply of the cattle, cleanliness of the byres, drainage, ventilation, light, storage of milk, utensils, etc. The report shows an improvement in the herds, their condition and cleanliness. Samples of milk from the dairies are tested periodically.

Night Soil.—Removal of night soil is done by four scavengers, who are required to have appliances suitable for the carrying on of the work. No pits are allowed to be more than 2½ feet deep (according to by-law), and under no circumstances can pits be partially emptied; they must be thoroughly cleaned, limed and disinfected. The work is required to be done in the day time, except in special cases when permission is granted by special order.

The removal of garbage has become a regular business with persons living outside of the city; so that very little is left for the city scavenger to look after.

Sewerage.—There was constructed during the year $\frac{3}{4}$ of a mile of trunk sewers. This additional drainage will improve the sanitary condition of the city.

Flushing of Sewers.—Complaints of foul smells from the corner gratings have been frequent. In most cases it has been found that decomposing organic matter exists in the sewers, and that flushing is necessary for its removal. The engineer's department is at once notified of the fact, and flushing is at once done. In certain parts of the city the evil is more common and it would be well if a general flushing was done systematically, especially where there is little, or sluggish, flow through the sewers.

It is gratifying to state that the police constables, told off to assist the health department, during the year, in carrying out the work, did good service, and that their aid is duly appreciated.

In conclusion let me say that the location of our city is one naturally highly favorable, from a sanitary point of view. The deaths from contagious diseases this year are as follows:—Typhoid Fever, 3; Diphtheria, 1; Mem. Croup, 1; Whooping Cough, 2. With a good water supply (which we have), and our drainage system completed Kingston will be a healthy city.

I have the honor to be,

Gentlemen,

Your obedient servant,

SAMUEL H. FEE,
Medical Health Officer.

LONDON.

REPORT OF MEDICAL HEALTH OFFICER, ALSO REPORT OF COMMITTEE ON CONSUMPTION.

November 15, 1898.

To the Chairman and Board of Health:

GENTLEMEN,—I have the honor to lay before you my annual report upon the sanitary condition of the city, death rate and other matters relating to the public health for the year ending November 15th, 1898.

The number of deaths during the year was 472, twenty-four of these being due to the lamentable accident at the city hall in January. This does not include twenty-one still-born, which, never having had a separate existence, cannot be counted in mortuary statistics.

Two hundred and ninety-five cases of infectious diseases occurred in the year, as follows:—

Scarlet fever.....	114
Diphtheria.....	108
Typhoid fever.....	46
Consumption.....	26

The last disease is not reported to the health office.

One hundred and ninety-seven cases of infectious diseases were sent to the General Hospital, viz:—

Typhoid fever.....	29 and 1 death.
Scarlet fever.....	55 and 5 deaths.
Diphtheria.....	87 and 3 deaths.
Consumption.....	26 and 2 deaths.

St. Joseph's Hospital received seventeen cases of typhoid fever, with two deaths.

There were ninety-nine deaths from consumption, and fifty-four from all the other infectious diseases combined.

Leaving out consumption it will be seen that of the remaining 188 cases treated in the General and St. Joseph's Hospitals there were only eleven deaths, or a mortality of not quite six per cent.

As patients outside the hospitals are attended by the same physicians as those in the hospitals, the great difference in the death rate in favor of the hospitals can only be accounted for by better sanitary surroundings and better facilities for combating disease, which are not always within reach of the sick in their own dwellings. There is also the fact that several cases sometimes occur in succession in the same dwelling, the first one only being reported.

Of the 472 deaths in the city, consumption is given as the cause of ninety-nine, or more than one-fifth of the number.

At the convention of the Medical Health Officers held in Ottawa in September last, it was shown that there were 3,000 more deaths in the Dominion last year from consumption than from all the other infectious diseases put together, and that in Ontario one person in every 1,000 died annually from consumption. The province last year lost 2,500 wage-earners, and a direct loss of \$2,500,000, and an indirect loss impossible to estimate.

Consumption is contagious, and, therefore, much can be done in the way of prevention.

In this connection the recommendations of the committee appointed by your Board are of such importance to the public that a printed copy should, if possible, be placed in every family, and I would suggest, as the best means of accomplishing this, that these recommendations and instructions to the public be printed on the backs of the assessment commissioners' slips left at each dwelling, and would then unfailingly reach every householder in the city.

There are three clauses in the recommendations of your committee which should be incorporated in the city by-laws relating to public health, or in the Ontario Public Health Act. They are as follows:—

1st. Physicians should report all cases of consumption to the Medical Health Officer for purposes of record, but the placarding of houses where such patients live is not required.

2nd. All deaths from consumption and chronic bronchitis should be promptly reported by the physicians to the Medical Health Officer, so that he may order and superintend such means of disinfection as he may deem necessary, and the city clerk should refuse to issue burial certificates in cases of consumption until the death certificate has been endorsed by the Medical Health Officer.

3rd. Managers of free libraries and other public and Sunday school libraries should not issue books to consumptive patients or their families, and their officials are requested to have printed on their library cards a notice to this effect, "No books will be issued to persons residing in any house where there is a case of consumption, diphtheria, scarlet fever, typhoid fever or other infectious disease."

Cancer caused the death of thirty-five persons. The number of people dying from this disease is, in proportion to the population, increasing every year.

The proposed by-law respecting the sanitary plumbing of buildings is still in abeyance. An excellent plumbing by-law was formulated by the Board of Health and master plumbers of the city. A by-law regulating house plumbing is very much needed in the interest of public health, and it is to be hoped that next year's city council will see their way to pass this by-law.

During the year West London, with a population of 1,885, was annexed to the city, making the population of London now 38,575. The increase in the population of the city during the year, exclusive of London West, was 466. This is a very satisfactory increase and shows the steady growth of the city.

A report upon the condition of herds, dairies and the quality of milk supplied the city during the last six months will be laid before you this month.

The sanitary condition of the city has been very good, and it gives me great pleasure to again report an exceedingly low death rate—12.3 in every 1,000 of the population. This is the same as last year, and when the new system of trunk sewers shall have been completed there is every prospect of this death rate being reduced still lower.

Your obedient servant,

T. V. HUTCHINSON, M.D.,

Medical Health Officer.

Cramming in the Schools.—Prof. Bowman moved that the Board approve of the action of those medical men who agitated the question of the over-taxation of pupils in the city schools by giving them more homework than was consistent with their health. Mr. Bowman said the evil had become so great it was necessary that something should be done.

The motion was approved, and a suggestion by Mr. Pritchard that Prof. Bowman, Dr. Campbell and the mover be a committee to confer with the School Board on the matter, will be carried into effect.

The Board approved of the action of city medical men in speaking against the cramming methods prevailing in the public schools.

Alderman Taylor presided, and also present were Prof. Bowman, Messrs. Christie and Pritchard, Dr. Campbell and the Board officials.

The report of the committee on consumption was as follows :—

Consumption is the most prevalent and the most fatal of diseases in Canada. Last year in the Dominion there were 3,000 more deaths from consumption than from all other infectious diseases. In Ontario one person in every 1,000 dies annually from consumption. Last year the province lost 2,500 wage-earners from this disease—which means a direct loss of \$2,500,000, and an indirect loss of an almost incalculable sum besides. In London this year out of 472 deaths ninety-nine were from consumption, and fifty-four from diphtheria, scarlet fever and typhoid, so that about twice as many died in this city from consumption as from all other infectious diseases. Two deaths in every nine were from consumption.

Consumption is contagious, therefore, many deaths from this disease might be prevented. It is also curable in many cases when taken in time.

The hygienic remedies for consumption are pure air and pure food. To secure proper treatment for the majority of people, sanatoria in rural districts are recommended—institutions to which consumptives can be sent as soon as the disease is detected, where they can receive proper care, while at the same time their families and homes can be protected from contagion. This work will have to be done by municipalities, with such aid as may be received from philanthropists. As London has taken on itself a heavy burden this year in the matter of hospital construction, it cannot be expected for some time to do anything in the way of a consumptives' sanatorium. But there is a great opportunity here for private effort by the citizens in this respect, following the example of Toronto, which has lately appointed a local committee to proceed with the establishment of a sanatorium. The only one at present in operation in Ontario is situated in Gravenhurst.

Meanwhile, there are duties and responsibilities resting upon citizens and municipalities alike, the careful observance of which cannot but result in great benefit on the community and the saving of many lives.

As the poisonous germs of consumption are disseminated largely through the dried sputa, or matter expectorated by diseased persons, special care should be taken with this substance to prevent the spread of contagion.

There should be no spitting in public buildings, conveyances or on the streets. Persons with cough should always use a handkerchief or vessel provided for the purpose. The former should be burned and the latter purified frequently by some strong disinfectant. In street cars and other public conveyances, and in public buildings placards forbidding spitting should be posted, and a sufficient number of spittoons provided. These spittoons should be cleaned daily with boiling water and a strong disinfectant.

In order further to avoid danger from infected dust the rooms occupied by consumptives should have no carpets or unnecessary furniture, ornaments, curtains, etc. The floors should be wiped with a damp cloth, and no broom used. The room should be frequently disinfected, invariably after the death or removal of a patient.

As consumption may be conveyed through meat and milk, special care should be taken by the Board of Health and its officials that no diseased articles of food are sold. It is further advised that milk should be boiled before it is used.

Physicians should impress upon all consumptive patients and their friends the communicable nature of the disease. They should report all cases to the Medical Health Officer for purposes of record, but the placarding of houses where such patients live is not required.

The managers of the free library and all other public and Sunday school libraries should issue no books to consumptive patients or their families, and these officials are requested to have printed on their library cards an announcement to the effect that "no books will be issued to persons residing in any house where there is a case of consumption, diphtheria, scarlet fever, typhoid fever or other infectious disease."

The Medical Health Officer shall report monthly to this Board the deaths from consumption and other infectious diseases.

The city council is requested to amend its by-laws wherever necessary to assist in carrying these recommendations into effect.

The report was received and adopted.

OTTAWA.

REPORT OF THE MEDICAL HEALTH OFFICER.

Dec. 19th, 1898.

To the Chairman and Members of the Local Board of Health :

GENTLEMEN,—I beg to lay before you the annual report of the Health Department for the year ending 31st October, 1898.

In so doing I have to crave your indulgence and apologize for its brevity and incompleteness owing to causes too well known to every member of your board to need repetition here. I am pleased, however, to record the fact that during the period comprised in this report the public health has been generally good, as evidenced by a smaller death rate than that of the previous year, notwithstanding our large increase of population.

Mortality.—The total mortality for the year just ended, exclusive of still-births, was 1,122, that of the previous year, 1,128.

This, with our estimated population of 56,000, gives us a death rate of 20.5 per thousand, a very fair showing, I submit. 556 out of the total mortality were of children of five years of age and under, including for the period the death roll of the foundling institution, the House of Bethlehem.

Contagious Diseases.—With the exception of measles, an epidemic of which prevailed during the spring months, and cerebro spinal meningitis, cases of which were apparently more common than usual, we have had during the past twelve months less zymotic diseases than in the past three or four years. It is quite evident however, as shown in Table I here appended, that among constitutional diseases, phthisis or consumption, is still by far the largest factor in the make up of our death roll as a cause of death, and every community throughout the civilized world is hopeful that in the near future some effective practical means will be devised to stay the ravages of this fell destroyer.

Table II here attached shows the number of cases of infectious diseases admitted into the isolation hospitals, and the very satisfactory results obtained by the treatment applied or received here.

Tables III and IV here appended show respectively the number of infectious diseases reported in the health office, and the records of the House of Bethlehem for the past year. I regret to say, however, in connection with the former table, that excepting as regards diphtheria and scarlet fever, the figures there recorded are not strictly reliable, owing to the fact that physicians still continue remiss in reporting such cases as typhoid fever, measles, mumps and whooping cough, that occur in their practice.

Ice Inspection.—The ice dealers of this city have willingly complied with the regulations of your board in taking their supplies either from the Ottawa river or from the Gatineau river.

Milk Inspection.—In the early part of the year sixty-four samples of milk taken from the different milk vendors of this city were tested by me with the result that fifty-six samples were found satisfactory and classed as good milk and eight samples as poor milk, and below average as regards butter-fat. In order to protect the consumer in this very important article of food, it is to be hoped that the by-law enacting the production of a certificate of the application of the tuberculin test to dairy farm cattle before the obtaining of a license, passed by the corporation last year, will be amended by the council so as to facilitate its effective enforcement without unnecessary onerous conditions to the milk vendors.

Owing to the dismissal of the sanitary inspector by the council about the last of the summer, an action which, by the way, I cannot but look on as as not unjustified, I am unable to give any details of the work which more particularly pertained to that officer.

In conclusion it is my unpleasant duty to protest against the unfair treatment which your board has been subjected to by the council of the year just ending, as calculated to impair its usefulness to a very large extent, and to retard the initiation of such sanitary improvements the want of which had been felt for many years.

Respectfully submitted,

A. ROBILLARD, M.D.

TABLE I.

Total mortality from all causes during the year 1898.

Diseases.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	Total.
Appendicitis										1	2	....	3
Asphyxia									1				1
Apoplexy	1		1	3	1	1		2		2	2	1	14
Anæmia			1	1		3				1		1	6
Abscess					1		1						2
Angina pecto.					1								1
Accidental:													
By cars	1		2		1	1		2	1	1			9
" burns		6						1			1	1	9
" falls					1		1			1			3
" strangulation			1										1
" falling of shed				1									1
" drowning	2						3		3	1			9
Bronchitis	3	2	2	4	2	8	5	3	3	2	2	6	42
Bright's disease	1	1			2			1		1			6
Congenital malformation			1				1	1		1	1		5
Child birth									1	1			2
Cerebritis	1			1			1		1				4
Cancer	3	4	2	4	2	1	1	3	2	5	2	6	35
Cystitis	1		1		1	1			1	1	1	1	8
Cholera nostras									2	2			4
Diphtheria	1	3	3	3	2	3	4	4			1		24
Dropsy	1				1		2	2			2		7
Diabetes		1			1				2	1		2	7
Erysipelas			1			1				1			3
Eclampsia	1												1
Epilepsy		1				1	1			2		1	6
Gastro enteritis	2	1	1	3	3	5		3	4	2	2		26
General debility:													
Senile		1	2	6	2	2	3	1		1	2	3	23
Infantile	4	1	3	2	5	2	2	2	2	2	1	2	27
Heart disease	4	7	4	3	2	3	2	3	8	3	8	4	51
" failure	2	1	1		1	1	1	1				1	9
Hepatitis			2			1		1			1	2	8
Hydrocephalus			1						1	1	1		4
Hemorrhage	1	1		1	2		2	2			3	2	14
Insolation									1		1		2
La grippe		1		1									2
Laryngitis				1	1								2
Meningitis	1	1	4		3	3	6	4	5	5	1	2	35
Myetitis			1										1
Nephritis	2	2	3	2					1		1	1	12
Old age	2	4	1	2	3	2	3	4	2	3	3	2	31
Pneumonia	9	4	6	4	8	11	12	4	7	7	3	7	82
Peritonitis		2	3	5	2	4	3	1	5	4	2	1	32
Puerperal fever			1										1
Paralysis	2	4	2		4	7	3	6	2	2	4	4	40
Pertussis	1	1	2	3						1	1	2	11
Pleurisy						1							1
Premature	1	2	5	3	8	2	6	3	2	1	3	2	38

TABLE I.—*Continued.**Total mortality from all causes during the year 1898.*

Diseases.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	Total.
Rheumatism .....	...	1	...	...	...	...	...	...	...	...	...	...	1
Scarlatina .....	...	1	...	1	...	2	...	...	...	...	...	...	4
Septicemia	3	1	1	...	2	1	1	1	...	2	...	...	12
Syncope .....	...	...	1	...	...	...	1	1	...	1	1	2	7
Scrofula .....	...	...	...	...	1	...	...	1	1	1	...	...	4
Surgical shock .....	...	...	...	...	...	1	1	...	1	...	...	...	3
Suicides	2	1	...	...	2	...	...	1	...	...	...	...	6
Typhoid fever	2	1	...	...	...	...	2	...	2	3	2	5	17
Tetanus .....	...	1	...	...	...	...	...	...	...	1	...	...	2
Tumour .....	...	...	...	...	...	...	...	1	1	1	1	1	5
Tuberculosis	8	9	10	8	12	19	9	11	13	11	5	12	127
Diarrhoea and other diseases inci- dental to dentition	7 2	5 7	3 4	5 3	7 4	7 13	12 5	26 7	60 12	33 8	12 6	6 9	} 263
Uræmia .....	...	1	...	1	1	...	...	...	...	1	1	...	
Totals	71	79	76	71	88	107	94	103	149	118	77	89	1,122
Exclusive of still-births	5	7	8	7	5	6	4	9	7	8	7	8	81

TABLE II.

Showing the number of patients treated in the Isolation Hospitals and death rate during the year ending October 31st, 1898.

Distribution.	Protestant Annex.					R. C. Annex.				
	Diphtheria.	Follicular tonsillitis.	Scarlatina.	Suspected scarlatina.	Measles.	Diphtheria.	Follicular tonsillitis.	Scarlatina.	Suspected scarlatina.	Measles.
Admitted during year	93	3	16	4	8	88	3	37	2	10
Discharged "	84	3	16	4	8	81	3	35	2	10
Deaths "	9	.....	.....	.....	.....	7	.....	2	.....	.....
24 of the above recorded cases were from outside the city.					11 of the above recorded cases were from outside the city.					

Though the mortality here recorded is not very large, still it is larger than it would be under ordinary circumstances, owing to two facts : 1. The very large percentage of croupal or laryngeal cases treated in the hospital during the past year, over one-quarter of the number of cases admitted being such. 2. The fact that quite a few of these cases came to the hospital in a moribund condition, and died a few hours after their admission.

TABLE III.

Showing number of infectious diseases reported at the Health Office during the year 1898.

Diseases.	No. of cases.
Diphtheria, including croup	149
Scarlet fever.....	48
Measles	131
Typhoid fever	195
Total	523

TABLE IV.

Record of the House of Bethlehem for the year 1898.

How disposed of.	No. of cases.
Admitted during the year	249
Placed outside or returned to parents	100
Died during the year.....	122
Remaining in House on November 1st, 1898.....	27
Total	

ST. CATHARINES.

REPORT OF THE MEDICAL HEALTH OFFICER.

November 15th. 1898.

To the Mayor and Council of the Corporation of the City of St. Catharines:

GENTLEMEN,—In accordance with the requirements of the Public Health Act, I herewith submit my annual report of the sanitary condition of the city for the year ending the 15th day of November, 1898.

Contagious Diseases.—An outbreak of a mild type of scarlatina and German measles in October, occurring principally among pupils attending one of the schools situated in the Ward of St. Andrew, rendered it expedient in the opinion of the Board of Health to close the public and separate schools in the ward, as well as the Sunday schools, in order to prevent the danger of these affections becoming epidemic.

The trustees of the public schools very properly availed themselves of this opportunity to have the class rooms thoroughly cleansed, and disinfected, and to render more perfect the ventilation and sanitary surroundings. I am of the opinion that, owing to the existence of a substratum of quicksand beneath the foundation of the school premises at the junction of Church and William streets, a drain should be constructed to carry the subsoil water into the Ontario Street sewer, in addition to what has already been accomplished in the way of sanitary improvement.

Severage.—I desire to congratulate the Mayor and Council and the citizens generally on the progressive extension of the system of drains and sewers, and of the installation of the "Miller Automatic Flush Tank," without which no thorough and systematic cleansing and ventilation of the sewers can be accomplished; as the occasional flushing with hose, although useful at the time, is not repeated often enough to prove efficient in removing the decomposing deposits that accumulate in the interim. It is necessary that the sewers should be flushed every day in order to remove effectually these deposits, and to prevent the sewers becoming elongated cesspools which generate offensive and noxious gases.

It is encouraging from a sanitary standpoint that nearly all the newly erected residential buildings have been connected with sewers wherever it is possible to do so; and it would be of great advantage to the health and comfort of those concerned if cesspools could be entirely abolished in the case of houses situated on streets furnished with sewers.

Nearly every year complaint is made of the peculiar milky appearance, and disagreeable odor and taste of the city water. As this condition of things led some of our citizens to fear that the water was unwholesome, I sent samples of it on two occasions to Dr. McKenzie, the Bacteriologist of the Provincial Board of Health, for analysis; and am pleased to be able to state that his report on both occasions was satisfactory. He assured me that the city water was "good public water," and that it was devoid of any pathogenic germs.

The attention of the Board of Health having been called to the proposed intention of the authorities of the Township of Humberstone, in the County of Welland, to drain the swamp and a lying east of the Welland canal into that channel, an act which would tend to pollute the waters of the canal, and injuriously affect the purity of the water supply of this city, I communicated the facts to Dr. Bryce, the Secretary of the Provincial Board of Health, and that gentleman promised to take prompt action to protect us. He has faithfully, and I hope successfully, given effect to this assurance; and I consider that he is entitled to the cordial thanks, not only of the citizens of St. Catharines, but also of those of Welland and Merriton, whose sanitary interests were threatened by the proposed tapping of the canal for drainage purposes.

The Sanitary Inspector and Secretary of the Board have faithfully discharged their respective duties. Their reports are herewith submitted.

On consulting the accompanying report of the Secretary it will be observed that the total number of deaths from all causes occurring in the city from the 15th November, 1897, to the 15th November, 1898, was 165. Deducting from this number the deaths from old age, premature births, and accidents, twenty-five in all, I find the rate of mortality, calculated upon a basis of population of 10,274, is 13.60 per 1,000 of inhabitants.

Respectfully submitted,

E. GOODMAN, M.D.,

Chairman.

REPORT OF SANITARY INSPECTOR.

To the Chairman and Local Board of Health of the City of St. Catharines:

GENTLEMEN,—I have the honor herewith to submit my annual report (as Sanitary Inspector of your honorable Board) for the year ending November 15th, 1898, and say:—

That I have placarded 33 houses during the year, in compliance with the medical returns of contagious diseases.

I have frequently visited the cow-byres, slaughter-houses, livery and hotel stables, canning and other factories within the city when necessary, and have found them generally in a cleanly and sanitary condition.

The city sewers have been frequently flushed during the year, and have been disinfected when necessary.

The streets, lanes and yards have received my strict attention, and I am pleased to say that they have been kept clean generally.

The city scavengers have removed about 1,000 barrels of night soil during the year, and the work has been well and thoroughly done.

I have tested the milk sold by the vendors thereof, and the average registration has been 90 and 92, and no complaints of the quality has been made.

I have made 1,060 house to house inspections during the year, and am pleased to say that I was kindly received by all persons in connection therewith, who showed a willingness to comply with all orders and instructions in regard to sanitation.

I have made weekly visits to our City Isolated Hospital during the year, and have pleasure in saying that the said institution is in good order and condition, and ready for use should necessity require it at any time.

Respectfully submitted,

A. BOULDEN,

Sanitary Inspector

ST. CATHARINES, 17th November, 1898.

REPORT OF SECRETARY.

To the Chairman and Local Board of Health of the City of St. Catharines :

GENTLEMEN,—Herewith I have the honor to submit the annual statement of the number of deaths in the City of St. Catharines from November 15th, 1897, to November 15th, 1898, and the causes thereof ; also statement of the number of contagious diseases for the same period as per medical returns :—

Deaths.

Diseases.	Number.	Diseases.	Number.
Bright's Disease	3	Croup.....	2
Bronchitis	12	Heart disease.....	22
Apoplexy	3	Cyanosis	1
Consumption	17	Nephritis	1
Spinal disease	2	Cystitis	2
Inanitation	4	Inflammation of lungs	1
Pneumonia	12	Hæmoptysis	1
Cerebritis	1	Peritonitis	4
Intestinal obstruction	1	Accident	5
Old age	4	Premature birth	10
Convulsions	4	Anæmia	1
Still-born	4	Typhoid fever	4
Syncope.....	2	Morbis cordis	1
Inflammation of bowels	3	Marasmus	1
Paralysis	4	Blood poison	1
Gastritis	1	Ulcers	1
Tumor	1	Shock	2
Puerperal fever	2	Enteritis	1
Pericarditis	1	Tetanus	1
Malaria fever	1	Cholera infantum.....	2
Meningitis	3	Rheumatism	2
Exhaustion	1	Whooping-cough	1
Diarrhoea	2	Diabetis	1
Cancer	2	Diphtheria	1
Asphyxiation	1	Indigestion.....	1
Scarlet fever.....	1		
Tranumatic œsophagitis.....	1		
Appendicitis	2	Total	165

Contagious Diseases.

Reported.	Number.	Deaths.	Number.
Scarlet fever.....	41	Diphtheria	1
Typhoid fever	4	Scarlet fever	1
Diphtheria	4	Typhoid fever	4
Measles	3	Whooping-cough	1
Whooping-cough	1	Consumption	17
Mumps	5		
Consumption	17		
Total	75	Total	24

I have the honor to be your obedient servant,

J. ROLLISON,

Secretary.

ST. CATHARINES, 17th November, 1898.

ST. THOMAS.

REPORT OF THE MEDICAL HEALTH OFFICER.

ST. THOMAS, 1st April, 1899.

To the Chairman and Members of the Local Board of Health :

SIR,—In compliance with the requirements of the Public Health Act I have the honor to submit the annual report for the city of St. Thomas for the year Dec. 1st, 1897, to November 30th, 1898 :

The sanitary condition of the city has been good. Since the construction of sewers in almost every street and the provision of a sufficient supply of pure water typhoid fever and dysentery are of rare occurrence. We have at present upwards of twenty miles of sewers, and during the year another half mile has been added. They all empty into a common trunk sewer. I hope soon to be able to report that every street is properly drained.

The pit system is still in use to some extent, but gradually water closets are taking their place. As we are not using well water there is no contamination of water by pits and out door privies, the only injury being a noxious state of the atmosphere at night. The reason we do not require all householders to adopt the water closet system is that on a few streets there are, as stated, no sewers, and therefore no proper method of carrying out that system.

Following is the number of contagious diseases placarded during the year, and also the total number of deaths from other causes :

	Cases.	Deaths.
Diphtheria.....	36	2
Scarlet fever	22	1
Typhoid fever.....	2	2
Tuberculosis .....	..	13
		— 18

I have no means of knowing the number of cases of tuberculosis.

The number of deaths from other causes than contagious diseases was 102, making in all 120 deaths in a population of 11,250, or 10.66 per 1,000.

WM. C. VANBUSKIRK,

City Physician.

STRATFORD.

REPORT OF THE MEDICAL HEALTH OFFICER.

STRATFORD, November 1st, 1898.

To the Chairman and Members of the Local Board of Health :—

GENTLEMEN,—In submitting my report upon the sanitary condition of the city for the past year, I have pleasure in stating that our total mortality during that time was not materially increased from that of previous years.

Deaths.—The total number of deaths during the year was 89.

30 occurred in Romeo Ward.	Between 80 and 90.....	11 died.
24 " " Shakespeare Ward.	" 70 " 80.....	8 "
13 " " Avon Ward.	" 60 " 70.....	9 "
13 " " Falstaff Ward.	" 50 " 60.....	12 "
9 " " Hamlet Ward.	" 40 " 50.....	7 "
	" 30 " 40.....	6 "
	" 20 " 30.....	12 "
	" 15 " 20.....	4 "
	" 10 " 15.....	3 "
	" 5 " 10.....	4 "
	" 1 " 5.....	5 "
	Under 1 year.....	7 "
	Age not given.....	1 "
	Total.....	89 died.

Cause of death as given.

Consumption.....	14	Apoplexy.....	1
Heart failure.....	8	General debility.....	1
Cancer.....	8	Croup.....	1
Old age.....	9	Bright's disease.....	1
Pneumonia.....	6	Lung trouble.....	1
No cause given.....	6	Insane.....	1
Accident.....	5	Asthma.....	1
Typhoid fever.....	2	Paralysis.....	1
Diphtheria.....	4	Convulsions.....	1
Scarlet fever.....	1	Kidney disease.....	1
Measles.....	1	Endocarditis.....	1
Rheumatism.....	2	Liver complaint.....	1
Diarrhoea.....	2	Congestion of brain.....	1
Appendicitis.....	2	Operation.....	1
Inflammation of bowels.....	2	Growth on head.....	1
Dropsy.....	1		

Of the infectious diseases there were : Typhoid fever, 18, with 2 deaths ; diphtheria, 32, with 4 deaths ; scarlet fever, 17, with 1 death.

Consumption.—Consumption still heads the list as regards the number of deaths. It is gratifying to know, however, that the public, as well as the medical men, are becoming alive to the fact that the disease is communicable from one to another. It is now being classed amongst the infectious diseases. Physicians and scientists, not only in this country but also in European countries as well as in the United States, are doing all in their power towards the devising of ways and means to combat tuberculosis. In the monthly report issued by the Provincial Board of Health for September, the deaths from contagious diseases in the Province, as reported to the Registrar-General by the division registrars, throughout the Province 250 deaths were reported : 11 died from scarlatina, 33 from diphtheria, 44 from typhoid fever and 147 from tuberculosis, or 0.8 per 1,000 per annum, while the next highest, typhoid fever, was 0.2 per 1,000. The co-operation of societies having for their object the promotion of public health, the assistance of the public press, and the influence of legislation, will all be required to successfully carry out the desired end.

During the early part of the year we seemed to have been threatened with an epidemic of that much dreaded disease diphtheria, but strict vigilance on the part of your Inspector, together with the assistance of the medical attendants, in seeing that proper precautions were taken as regards isolation and disinfection, prevented its spread. Since the introduction of anti-toxin in the treatment of this disease a few years ago, a remarkable diminution has taken place in the mortality, only four deaths occurring out of the thirty-two affected.

Sanitary Inspection.—The usual amount of sanitary work was done, a general house to house inspection was made ; the water supply in houses where contagious diseases existed was examined ; the several dairies were visited, and the milk supply from time to time received attention, and on all occasions found satisfactory.

Sewerage.—The Sewer Committee reports satisfactory progress towards sewer extension, and the arriving at a satisfactory method of sewerage disposal. The uncalled for action of a neighboring municipality in menacing private individuals and institutions by dragging them into expensive lawsuits, when its Council was struggling earnestly with this important and hard-to-be-decided problem, merits censure rather than commendation.

J. A. ROBERTSON,

Medical Health Officer.

WINDSOR.

REPORT OF THE MEDICAL HEALTH OFFICER.

Dec. 1st, 1898.

To the *Members of the Board of Health* :

GENTLEMEN,—In presenting this, my annual report, I desire to say, by way of premise, that I have endeavored to avoid duplicating any portion of the reports of the secretary and the sanitary inspector.

I had noticed that on more than one occasion the secretary's report overlapped ground already traversed by the medical health officer and, believing that this tended to weary those who may be interested enough to peruse them, I requested those officers to present full reports upon the work covered in their respective spheres, so that nothing should be overlooked in this mode of reporting.

In dealing in this manner with the business of the year, I feel freer to draw your attention to what has been left undone, rather than to what has been effected ; and I do so at considerable length for the reason that the subjects included in the former were more varied, more subtle in the undermining of the public health and less readily grasped, on the nonce, by the average citizen.

To illustrate this point, I need only mention the fact that milk from tuberculous cows may be entering households that know nothing, by actual experience, of the deadly sewer gas (for want of a connection with our sewer system), nor are in danger from water-borne microbes or bacilli by reason of their using filtered or boiled water only.

In this connection, I would introduce an address prepared for my first meeting, officially, with this board, but which I did not then present because of the manner in which I was greeted on that occasion.

I have recently gone over the ground again, in the added light of observation and the study of the reports of the Provincial Board of Health, the reports of the Medical Health Officers throughout the Province, and the papers read before the meetings of the association of those officers, and I find that that address contains much that calls for your attention in the immediate future. I accordingly submit it as part of this report.

With regard to the inspection of the cow-byres and dairy farms, I can but conclude that, up to the time of the visit of Mr. Kidd, it had been but little short of a farce ; and considering it such, I deemed it my duty to draw your attention thereto, and to ask for your active interference. To that end I had prepared a report for your meeting in October, but my efforts in that direction were thwarted by the waste of time upon a matter that was entirely irrelevant. An appeal to the chairman, though supported by the signatures of the majority of this board for a special meeting met with a flat refusal. I had hoped to effect an arrangement whereby the visit of the Dominion Government officer could be utilized for the benefit of the milk consumers, and that he should be accompanied on his rounds by some members of this board. Having failed, as above stated, I throw the responsibility for the miscarriage upon your chairman, and ask you to lay the report referred to before the council.

On the 29th of August I submitted to the council a report upon the examination of sixty-eight samples of milk collected by the sanitary inspector, from the milk vendors ; and, as it was referred to the finance committee for consideration, I prepared a special report upon the inspections that had been made up to date, in order that the whole question might be considered intelligently and with the view to remedying, as far as possible, the evils that had been permitted to grow up. At the request of that committee I examined twenty-four more samples—collected from some of the vendors previously visited, and eight samples from vendors who had been overlooked on the first rounds. I also collected twenty-four samples—some of them skimmed for my examination from parties who kept cows for private use only. This latter step was taken because the milk vendors claimed that the pasturage was responsible for the condition of the milk they had offered for sale, and proved very serviceable in estimating the situation properly. Upon these last samples I also reported and elaborated my former deductions.

As these several reports traverse the field pretty thoroughly, I have asked the finance committee to recommend to the council that they be referred to your committee on "food, meat and milk supply."

In this connection I would draw your attention to the report of Dr. Griffin, M. H. O. for Brantford, in which he states that by vigilance and perseverance, the average of butter fat in the samples examinee by him had reached 4.53 per cent. ; while, notwithstanding the repetition of examination by your milk inspectors, the average this year is only 3.45 per cent. in the sixty-eight samples examined.

I wish to put on record the very satisfactory manner in which the board of education met the wishes of the Provincial Board of Health as regards exacting the certificates of successful vaccination from each and every pupil ; and I am more than pleased to know that this exaction is to be continued in the future, for it will, in a few years, secure for thousands of our people a protection against smallpox that will obviate the necessity for proclaiming "public vaccination."

About 200 children have been successfully vaccinated in connection with my arrangement with the Sisters of the Hotel Dieu, and the results have been, on the whole, satisfactory and in strong contrast with those that obtained in connection with the vaccinating of the school children in 1894. I estimate that fully one thousand vaccinations have been made among school children on this occasion. This, together with the 1,200 vaccinated in 1894, places our school population on fairly satisfactory footing from this standpoint.

I find that by-law No. 877, "Public Health," does not contain a clause providing for the inspection of our ice supply, nor for defining and regulating the source from whence that supply shall be obtained. This is a very serious oversight, and should be at once remedied in order that this season's cutting may be supervised and put beyond a doubt as to its purity.

I learn from conversation with the physicians of this city that the use of antitoxin is becoming general, and now that a reliable article can be obtained on very short notice, no hesitation occurs in administering it.

The statutes provided for the inspection of the school houses and their environment by the M. H. O., when so requested by the Board of Health. I presume that their condition is satisfactory to this board, as I have not been asked to do duty in this respect.

So far as I can learn this Board has had no report from any source as to the condition of our water supply and has not taken any steps to that end. I cannot understand how this very important matter has been overlooked by your committee on "plumbing, sewerage and water supply." In Toronto and elsewhere the M. H. O. is authorized by the council to have the necessary examinations made from time to time. Taking advantage of Mr. Kidd's visit here, and the nature of the instructions from the Dominion Analyst, I asked him to send a sample to Ottawa, and I expect to have a report thereon in my own hands shortly.

The diphtheria regulations, though adopted by order-in-council on Dec. 23rd, 1891, have not, as yet, been put into force in this municipality, and though By-law No. 877, passed was subsequent to their promulgation, does not provide for their being complied with in some very important respects.

I would have brought this matter to your notice before, but I was told in March last, by resolution of this Board to reserve all such matters for my annual report in December. I must insist on a change being made in this respect, or I shall be compelled to report, as provided for in clause No. 2 of these regulations to the Provincial Board, "default on the part of the authorities."

In these regulations the M. H. O. is enjoined to do certain things that I find it impossible to comply therewith on account of the manner in which the business of this Board is conducted under By-law No. 877.

The Provincial Board of Health for instance has provided for the examination, microscopically, of the sputa and portions of false membrane expectorated by any suspected case of diphtheria so as to facilitate an early diagnosis, but, so far as I have learned this golden opportunity has not been utilized by any officer of this Board, nor is it likely to be under existing conditions.

I notice that the Provincial Board of Health at its last meeting debated, at considerable length, the necessity of adopting some system of examining the school-children daily and following up any case of suspected contagious disease in order to prevent the spread of such diseases among the children. The outcome of the debate was the passing of a resolution recommending daily visits by physicians who should trace all suspected cases, if possible, to their origin.

It has frequently been demonstrated beyond a doubt that, to the mingling of the affected children among the unaffected has been largely due the very rapid and extended spread of one or other of the contagious diseases, and, doubtless, in time, some means will be found to cover the field efficiently.

I have notified all the medical practitioners in the city of the resolution passed in '93 or '94 requesting the notification to this Board of cases of typhoid fever, as I found it was not being done.

The experience of the year points to the desirability of the M. H. O. having some sort of supervision over the use of the city ambulance.

I would suggest that forms for reporting to this Board all cases of suspected contagious diseases coming to the knowledge of any public school teacher, be furnished to each Principal for such purpose. In this way cases that are not being attended by any physician will become known to this Board officially.

In conclusion let me draw your attention to the provision in clause 16, By-law No. 877, with regard to the abolishment of the privy vault or pit along the lines of the sewered streets next year, with the view to suggesting that preparations be made to inaugurate the campaign with the beginning of the new year (1900).

All of which is respectfully submitted.

R. CARNEY, M. H. O.

REPORT OF THE SECRETARY.

WINDSOR, December 1st, 1898.

To the Chairman and Members of the Board of Health :

GENTLEMEN,—Pursuant to the provisions of section eleven of the Public Health By-law, I have the honor to submit for your consideration the following annual report upon the “Sanitary Work” done during the year; as well as upon the “Sanitary condition of the Municipality.”

Sanitary Work.—The annual cleaning of yards, alleys, etc., and the removal of the rubbish and other accumulations therein during the winter months, was perhaps more thorough this than in any previous year, the work of gathering and carting the same to the dumping ground having been effected not by day work as hitherto, but by means of a contract with Robert Briody, whose undertaking required him to continue at the job from the beginning of March until the 24th May, the price being \$250. The Inspector superintended the work constantly and was well satisfied with the manner in which Mr. Briody observed his obligations.

A more suitable dumping ground than the old one was secured from Mr. Briody at an annual rental of \$40, the location being remote from residences and of easy access. Six hundred and twenty-five closets in outlying parts of the city have been cleaned out at an average cost to the parties of \$1.25 each.

The plumbing by-law has been very generally enforced, and all new work as well as alterations and repairs, have been done under the supervision of and tested by the inspector. Thirteen new and forty old houses have been properly equipped and connected with sewers, and there have been eighty-four cases of drain and plumbing improvement and new plumbing effected—in all 137 cases in which the provisions of the by-law have been complied with.

On the application of owners, who have met the expense of the materials, eight stores and dwellings have been disinfected by the inspector.

The inspector has successfully prosecuted in the Police Court one offender for selling lump-jaw beef, one for selling decayed fruit, and three for maintaining nuisances upon their premises, namely, pig pens in two cases, and old bones and rags in the other. The officer also had destroyed as unfit for food a tierce of pork, a quantity of fish and of chickens.

Milk Inspection.—On August 3rd, no milk inspection having been made up to that date, the board requested the medical health officer to undertake that work at a time to be indicated by the chairman. Accordingly the inspector obtained for the purpose ninety-three samples from resident and non-resident dealers, some of which were taken on the 8th, 16th, 20th and 23rd days of said month. These were examined by the medical health officer, who reported thereon to the council in conformity with the provisions of the milk by-law, instead of to the board, as all previous medical health officers had done, with the result that the board has no knowledge of the nature of his investigation. The by-law, it is respectfully submitted, should be changed so as to require the report to be made to the board.

Contagious Diseases.—Contagious diseases have happily very largely given this city the go-by. Since the 15th December, 1897, there have occurred six cases of diphtheria, two of scarlet fever, two of typhoid and one of smallpox, in all eleven cases. One of the typhoid cases, that of a patient brought here from Michigan for treatment, proved fatal—the only death from any of the diseases mentioned during the year ending the 15th instant. The case of smallpox cost the board a good deal of money, to say nothing of the trouble entailed, and much advertising through foreign newspapers caused by the visitation, which, evidently for the purpose of attracting greater attention, was glibly referred to as an “invasion” of the dreaded disease. It was the case of a tramp, who variously gave his name as George Irving and Edward Maloney. He was locked up in the cells on the 5th February, and the same night was visited by the city physician, prescribed for, and the following day sent to Hotel Dieu, where the nature of his ailment was recognized and his removal from that institution back to the cells ordered by the Sister Superior. The then medical health officer was summoned, and he had the patient taken to the contagious disease hospital the same night. Thomas Davis, an old smallpox nurse, was placed in charge. On the 19th February the secretary of the Provincial Board of Health met the local board by appointment to ascertain the facts in regard to the case, after learning which he approved of the course pursued by the board and instructed the present medical health officer to keep a sharp look out for a person who spent a night in a cell adjoining the one occupied by the patient and who had been released and was at large, and vaccinate him as soon as found—all the other persons in any way brought into contact with him having been protected against contagion. Dr. Bryce also advised that the patient be detained ten days longer in the hospital, which advice was adopted. Nothing has since been heard of the man.

Vaccination.—The question of the general vaccination of the pupils attending the public schools of the city having been raised, a special meeting of the board was held on the 19th of August for the purpose of taking action upon that question. The chairman of the Board of Education was present by invitation. It was decided that in order not to interfere with school work, all the pupils requiring it should be vaccinated forthwith; the board instructed the medical health officer to telegraph for vaccine, appointed a physician to attend to each school house to examine and when found necessary vaccinate the pupils on the roll of such school, fixing the price of the work at 25 cents each pupil; ordered notices to be prepared and delivered at every house in the city, setting out the action and object of the board and affording all needful directions to parents and children; directed the medical health officer to supply the physicians appointed as aforesaid with the necessary vaccine points; authorized the chairman with the medical health officer to fix the precise date upon which the children were to attend at the school houses for examination, etc., and the chairman to supply record books for the use of the physicians, and also requested the medical health officer to prepare a form of certificate to be furnished the pupils for presentation to the teachers on the reassembling of the schools. The vaccine points, however, arrived so late, and some other difficulties arising in the interval, that it was found impossible to carry out the intention of the board; the points were returned unopened, and a warrant issued to the medical health officer for \$12.50 to be remitted for damage done to the points by their double journey from and to Quebec. Later on the Board of Education took the matter up and required all children attending school to produce by a fixed date (November 1st) to their teachers a certificate of successful vaccination. As some parents were confessedly unable to stand the expense of vaccination under the rule of the Board of Education, the Board of Health resolved on October 5th to furnish free vaccination to all poor persons and authorized the medical health officer to vaccinate all who should apply to him with a certificate from the president of the Home of the Friendless of their inability to pay, which certificate was deemed a necessary precaution against imposition. The result of these several steps to ensure protection from contagion for the youth of the municipality, will no doubt be communicated to you by the officer responsible for carrying them out.

The Hospital.—The contagious disease hospital is in as good a condition as a building of that description could well be. Everything necessary for comfortable occupation of patients has been provided and made ready for use. Fuel has been placed under cover, the heating apparatus increased so that two wards can be heated in fifteen minutes without waiting for the slower action of the large furnace, and come what may in the form of smallpox or other similarly dreaded maladies, the board is in a position to treat patients in a prompt, humane, and satisfactory manner.

Perhaps the most important duty the board next year will be called upon to face will be the securing of a new and if possible a more convenient site to which the hospital may be removed, as the existing lease will expire before the end of that year. This fact the overholding members will do well to keep in mind.

Sanitary Condition of the City.—It is perfectly safe to say that never before in its history has the sanitary condition of the place been as good as at present; and it is as certain that this satisfactory condition of things has been brought about by the persistency of the board in enforcing those by-laws designed to compel obedience to well-established ideas. People generally naturally shrink from expenses the immediate benefit of which they do not perceive. For example, house-owners generally will hesitate to provide effective plumbing and drainage for the premises they rent, and tenants are equally indifferent as to the cleanliness of their holdings, unless some authority backed by the strong arm of the law exercise watchfulness and interpose its power to effect proper conduct on the part of both these classes. So also in respect to isolation of persons afflicted with contagious and infectious diseases—if no restraining influence be exercised from without, people generally will utterly disregard danger and freely place themselves and the public in jeopardy. It sometimes, no doubt, appears like undue severity to compel a rigid observance of preventive measures; but in no other way can the health and security of the community as a whole be subserved; and the marked improvement in Windsor's condition, despite the lamentable state of the decayed wooden pavements on several of the most used streets, is directly and emphatically a tribute to the fidelity to its duties observed by the Board of Health the past few years.

Appended hereto is a table showing the deaths registered since December 15, 1897, to the date of this report and the causes thereof (with the ages of the victims) reported by the physician attending in each case.

I have the honor to be, gentlemen,

Your obedient servant,

STEPHEN LUSTED.

Secretary.

TOWNSHIPS.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Armour	Wm. Crawford, M.D.; Alex. Mackie.	.....	Typhoid, 2 cases; tuberculosis, 1 case.
Alfred.....	A. A. Gibault, M.D.; Joseph Brisebois.	When complaint is made to the Board.	Typhoid, 8 cases.....
Ashfield	F. M. McLennan, M.D.; Wm. Stothers.	No	Scarlatina, 2 cases; typhoid, 2 cases.
Alnwick	T. C. Lapp, M.D.; James Roberts.	Action taken only when complaint is made.	Diphtheria, 9 cases.....
Adelaide	F. J. Bateman, M.D.; H. J. Miller.	General, when the Board considers it necessary.	Scarlatina, about 30 cases
Athol	J. M. Platt, M.D.; Wm Moore.	No	Diphtheria, 13 cases.....
Ameliasburg.....	Drs. Thornton, File and Farncomb, M.H.O.'s; James Benson.	Yes; only when complaint is made.	Diphtheria, 2 cases; tuberculosis, 5 cases.
Anderdon	James Parke, M.D.; A. C. Maillaux.	Only when complaint of nuisance is made to Board.	Scarlatina, 2 cases; diphtheria, 3 cases, 1 death; typhoid, 1 case.
Arran	T. F. McNally, M.D.; Jas. M. Monckman.	General sanitary inspection twice a year, and member of Board visits schools once a year.	Typhoid, 1 case; tuberculosis, 2 cases.
Algona, S.....	—, Galligan, M.D.; T. McGreath.	No; no; yes	None.....
Arthur	A. J. Reynolds, M.D.; Geo. Cushing.	Yes; and special when complaint is made.	Scarlatina, 2 cases; diphtheria, 3 cases, 1 death; typhoid, 6 cases; tuberculosis, 1 case, 1 death.
Augusta	W. H. Waddell, M.D.; J. W. Place.	No; no; action taken only when complaint is made to Board.	Diphtheria, 8 cases.....
Anson & Hindon.....	C. D. Curry, M.D.; T. H. Rodgers.	Only when complaint is made to Board.	Scarlatina, 5 cases.....
Ancaster	G. D. Farmer, M.D.; Henry Pim.	Annual inspection of Village, of drains and cheese factories.	Scarlatina, 1 death; diphtheria, 6 cases; typhoid, 1 death; tuberculosis, 2 death.

TOWNSHIPS.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes	Yes	Yes	No
Private isolation. No....	Yes	Yes	No; no.....
No	No cases	Sometimes	No..
Isolated at homes; no hospital.	Yes; recently; extremely satisfactory.	Yes	No.....
Yes; no hospital	Yes	Yes	No; No.....
Yes.....	Think it is	Yes	No.....
As far as possible by isolation on premises.	Dr. Thornton, Consecon, has used it successfully in his practice.	Yes	Only when complaint is made; no.
Yes; house placarded	No	By attending physician..	No.....
Isolated and quarantined; no hospital.	No	Yes	Yes; no.....
Yes	Yes; no occasion to use it this year.	Yes	No; no.....
Yes; confined to one apartment of house and premises placarded.	No	The physicians in attendance have the supervision	Yes; no
Yes; when notified by physician.	No	M. H. O. disinfects, but in only one instance has the M. H. O. been notified by attending physicians.	No; no.....
Yes; no isolation hospital.	No diphtheria in 1898; antitoxine used in previous years with success.	Yes	No.....
As far as possible; no isolation hospital.	Used in all cases by M. H. O. with satisfactory results.	Under supervision of M. H. O.	No.....

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Alfred.....	No.....	Wells, about 20 feet.....	No.....
Ashfield .. .	No.....	Wells.....	No.....
Alnwick.....	No.....	Wells, about 20 feet.....	No; no.....
Adelaide.....	No.....	Wells.....	No dairy.....
Athol.....	No.....	Wells.....	No; no.....
Ameliasburg.....	No.....	Wells.....	Systematic inspection of cheese and butter factories only.
Anderdon .. .	No.....	Wells, from 30 to 60 feet.	No.....
Arran.....	Yes.....	Wells, from 10 to 40 feet deep.	No dairies in municipality; none
Algona, S.....	Yes.....	Wells, about 12 feet.....	No; no.....
Arthur.....	Yes.....	Wells, from 15 to 25 feet deep.	No; no.....
Augusta.....	No.....	Wells, 10 to 15 feet.....	No; none; lately; no ..
Anson & Hindon.....	No.....	Usually from springs.....	No.....
Ancaster. ....	.....	Wells, 14 to 55 feet.....	Yes; no test.....

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what portion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
2; not licensed; offal fed to hogs.	No.....	No.....	None.....	No.
2; no; buried when required.	No.....	No.....	None.....	No.
2; licensed; offal fed to hogs; no systematic inspection.	No.....	No.....	None.....	No.
1; used but once a week; offal boiled and fed to hogs.	Each family disposes of their own.	No.....	None.....	No.
2.....	.....	No.....	None.....	No.
No.....	No.....	No.....	None.....	No.
.....	.....	.....	.....	No.
None.....	No.....	No.....	None.....	No.
2; not licensed; offal is boiled and fed to hogs; no systematic inspection of carcasses.	.....	No.....	2; slaughter houses not licensed, but inspected.	No.
None.....	No.....	No.....	None.....	No.
One; yes; no inspection of carcasses; meat is sold in the adjoining village.	No; trustees of schools are required to keep water closets in a sanitary condition.	No.....	None.....	No.
No.....	No.....	.....	.....	No.
One; not licensed; no inspection.	No.....	No.....	None.....	No.
8; no licenses....	No.....	No.....	.....	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Amabel.....	T. Campbell, M.D.; R. Murray.	General sanitary inspection; township divided into divisions, with sanitary inspector for each district.	Diphtheria, 4 cases, 1 death; typhoid, 5 cases, 1 death; tuberculosis, 7 cases, 2 deaths.
Albermarle.....	— Wigle, M.D.; C. E. Wincher.	Action taken when complaint is made.	.....
Assignack.....	.....	General inspection at intervals.	None.....
Alice & Fraser.....	G. E. Josephs, M.D.; J. M. Kennedy.	Only when complaint is made.	Diphtheria, 3 cases, 3 deaths; tuberculosis, 1 case, 1 death.
Amherst Island.....	None.....	No; no; when called upon.	Tuberculosis, 2 cases....
Artemesia.....	J. G. Hutton, M.D.; W. J. Bellamy.	No; action taken on notice.	None reported.....
Adjala.....	— Wright, M.D.; P. J. Haffey.	No; no action, only on complaint.	None.....
Alberton.....	R. Moore, M.D.; J. D. Stewart.	When complaint is made to Board.	Tuberculosis, 1 case, 1 death.
Burges, N.....	No M.H.O.; P. McFarland.	No.....	None.....
Bexley.....	J. Grant, M.D.; Alfred Tayor.	Action is taken when complaint is made to Board.	Diphtheria, 1 case; typhoid, 1 case.
Burford.....	R. Harbottle, M. D.; Philip Kelly.	No; only upon complaint.	Scarlatina, 7 cases; typhoid, 2 cases, 2 deaths; tuberculosis, 2 cases, 2 deaths.
Bastard & Burgess, S.....	John G. Creegan, M.D.; Walter Beatty.	No; no; yes.....	Typhoid, 1 case; tuberculosis, 1 case, 1 death.
Bedford.....	— Parker, M.D.; James McNeil.	Yes; no; action taken when complaints are made.	Tuberculosis, 1 case, 1 death.
Brock..	McDermott & Jardine, M. D.'s.	.....	Scarlatina, 50 cases; diphtheria, 3 cases; tuberculosis, 3 cases.

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; no isolation hospital; by means of empty and isolated building.	Yes; when used early results have been good.	Yes	Yes; no.....
Partially carried out; no hospital.	Yes	It would be if necessary.	No
No; no hospital	No	Yes	No; no.....
House and family isolated and disinfectants supplied.	Yes; good	Yes	No.....
No; no	No occasion to use it.....	Don't know	No; no.....
No	No.....	Yes	No.....
No cases .....	.....	.....	No.....
.....
No .....	.....	.....	No.....
Yes; by isolation of house and compartments of patient.	Yes; Dr. Grant reports results most satisfactory.	No; but is under the direction of M. H. O.	No.....
Yes .....	.....	No	No; no.....
No; no hospital	No	No	No; no.....
Yes; isolated at their homes; no hospital.	No	Yes	No.....
Yes; houses placarded and inmates not allowed to mingle with others for a month; no isolation hospital.	Yes; all cases recovered under its use.	Yes	Yes.....

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Amabel.....	Yes.....	Wells, average 12 feet...	No; no.....
Albermarle.....		Mostly spring and lake water.	No.....
Assignack.....	No.....	Wells, 12 feet.....	No.....
Alice & Fraser.....		Wells and springs, 40 feet deep.	No.....
Amherst Island.....	No.....	Bay water and wells...	No; no.....
Artemesia.....	Yes.....	Wells, from 15 to 60 feet.	No.....
Adjala.....	No.....	Wells, usually, 25 feet deep,	No; no; no.....
Alberton.....	No.....	Rainy River.....	.....
Burges, N.....		Wells, 20 feet.....	No.....
Beseley.....	No.....	Wells, 12 to 50 feet.....	No; no.....
Burford.....	No.....	Wells and springs.....	No; yes.....
Bastard & Burgess, S.....		Wells, from 8 to 36 feet..	No; yes; the tuberculin test has not been used.
Bedford.....	No.....	Wells.....	No tuberculosis in township; no test.
Brock.....	Yes.....	Wells, 24 to 40 feet.....	No; yes; yes.....

TOWNSHIPS.—*Continued.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what portion of houses to which is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
2; no; offal supposed to be buried; no.	No	No.	None.....	No.
None	No.....	No.....	None.. . . .	No.
2; none licensed....	None.....	No	None.....	No.
None.....	No	No.....	None.	
One; not licensed ..	No	No.....		No.
One; no; don't know.	No.....	No.....	None.....	No.
None.....	No.	No.....	None.....	No.
None.....		No	None.....	No.
None.....	No.....	No.	None.	No.
None.....	No	No.....	None.....	No.
Don't know; not licensed; fed to hogs.	No.....	No.....	None.....	No.
None; no	No	No.....	None.....	No.
None.....	No.....	No.	None.....	No.
2; yes; buried; no.	No.....	No.	None.. . . .	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Belmont & M.....	W. J. Jeff M.D.; Porter Preston.	No inspection; action taken only when complaint is made to Board.	Tuberculosis, 3 cases....
Bosanquet.....	H. S. Clerke, M.D.; Geo. Sutherland.	.....	Scarlatina, 5 families; typhoid, 2 cases; tuberculosis, 2 cases.
Bayham ..	A. B. Kiddell, M.D.; J. G. Pauling.	Action taken only when complaint is made.	Scarlatina, many cases; diphtheria, 3 cases, 1 death; typhoid, 1 case, 1 death; tuberculosis, 1 case, 1 death.
Blenheim.....	J. A. Mitchell, M.D.; W. F. Ainslie.	School houses and slaughter houses are inspected and action taken when complaints are made.	Scarlatina, 28 cases, 1 death; diphtheria, 12 cases; typhoid, 1 case.
Brant	A. B. Taylor, M.D.; J. H. Cannon.	Yes; one annually, and also when complaint is made.	Scarlatina, 3 cases; diphtheria, 3 cases, 1 death; tuberculosis, 4 cases, 4 deaths.
Brantford	C. D. Chaplin, M.D.; Robt. M. Wilson.	Action taken only when complaint of nuisance is made.	Scarlatina, 2 cases; tuberculosis, 2 cases, 2 deaths
Bathurst ..	No M.H.O.; P. McKinley.	Yes; yes.	Diphtheria. 3 cases.....
Blanshard	A. K. Ferguson, M.D.; J. H. Jameson.	Yes; yearly.....	Scarlatina, 18 cases; typhoid, 7 cases, 1 death; tuberculosis, 1 case, 1 death.
Brighton	N. B. H. Dean, M.D.; D. Crouter.	No general inspection; under supervision of sanitary inspector.	Diphtheria, 2 cases, 2 deaths; typhoid, 1 case, 1 death.
Bertie	N. Brewster, M.D.; A. H. Kilman.	Annual inspection ordered in May; action on complaint thereafter.	Diphtheria, 6 cases, 2 deaths; typhoid, 17 cases, 1 death; tuberculosis, 2 cases, 1 death.
Brooke.....	A. Mackinnon, M.D.; W. G. Willoughby.	Cheese factories are inspected usually; other inspections when complaint is made.	Scarlatina, 1 case, 1 death; tuberculosis, 2 cases, 2 deaths.

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
No	Not in common use; good results when used.	No	No
Yes	No	Generally by attending physician.	No; no
Houses placarded; household isolation; no hospital.	Yes; with favorable results.	No	No
As far as possible; no isolation hospital; places placarded.	Yes; antitoxine used successfully in 4 of the 5 cases mentioned.	Yes; in almost every case.	Yes; nothing has been done towards vaccination for several years by the Board.
Isolated in the homes; no hospital.	No	Attending physician or M. H. O. notify Sanitary Inspector, who disinfects and removes placard.	No
No isolation hospital; patients isolated as far as possible in their homes.	Antitoxine has been very frequently used; results seem quite satisfactory, but the number of cases does not admit of a definite conclusion.	Disinfecting generally left to attending physician, but more or less observation is kept on the cases by the Medical Health Officer.	No
Yes; houses placarded and wants of inmates attended to; no hospital.	Yes; no deaths occurred ..	Yes	No
Yes; houses placarded....	Yes	Yes	Yes; no
No occasion for isolation hospital.	.....	Under direction of physician in attendance or M. H. O.	.....
Placards used; isolation of family; no hospital.	Antitoxine has been used with some apparent success by physician in charge, but not used by board.	Yes; under M. H. O...	No; no
To some extent .....	.....	Yes	No; no

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Belmont & M.	No	Don't know	No inspection; no cases of tuberculosis.
Bosanquet	No		
Bayham	No	Wells, 12 to 30 feet	No; no cases of tuberculosis reported or known
Blenheim	Yes; to medical men....	Wells, from 15 to 40 feet.	No; no cases reported ..
Brant	Forms are supplied physicians practicing in municipality.	Wells and springs	One inspection of dairy cows held during the year no case of tuberculosis,
Brantford	No	Wells, average depth about 25 feet.	No
Bathurst	No	Various	No
Blanshard	Yes	Wells, from 20 to 40 feet.	No
Brighton		Mostly wells	No
Bertie	Physicians only	Wells, varying 18 feet in soil to 50 feet in rock.	No; no
Brooke	Supplied, but not used ..	Generally by wells	No; no tuberculin test has been used.

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No., and kind of noxious trades (See sec 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
Don't know of any ..	No	No	None	No.
One				No.
3; no; offal buried; no.	No system	No	None	No.
4; no license; usually fed to pigs; no; 4.	No	No	None	No.
10; licensed; when favorably reported by sanitary inspector: boiled or buried; carcasses not inspected.	No	No	laughter houses....	No.
9; not licensed; don't know; offal is disposed of; no inspection of carcasses.	No.	No	9; slaughtering of animals.	No.
Two	No	No	Slaughtering of animals.	
None	No	No	None.	
3; not licensed; offal generally fed to hogs.	Not generally	No	None	No.
5 or 6 farm butchers; they are ordered to bury or burn the offal; no systematic inspection.	No	No	None	None.
Two; no; buried; no.	No	No		No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Bonfield.....	—, Berute, M. D.; Thomas Cahill.	Only when complaint is made to Board.	Scarlatina, 10 cases; diphtheria, 2 cases; tuberculosis, 1 case.
Burleigh & A.....	A. R. Caldwell, M.D.; P. W. C. Shewen.	Inspection was partially made in spring of '98, and when deemed necessary.	.....
Brougham.....	R. G. Conolly, M.D; M. Sheedy.	No; no; when complaint is made.	Diphtheria, 3 cases, 1 death.
Beverly.....	J. T. Manes, M.D; W. McDonald.	No; no; action taken when complaint is made	Diphtheria, 9 cases; typhoid, 6 cases.
Bentinck.....	No M.H.O.; D. Campbell.	General inspection in the spring, and at intervals when complaints are made.	Scarlatina, in 3 families, 2 deaths; diphtheria, in 2 families; tuberculosis, 8 cases reported.
Burpee..	T. Johnston, M.D.; Isaac Campbell.	When complaint is made.	.....
Barton.....	No M.H.O.; H. Bryant	When complaint is made to Board; also at intervals.	.....
Blandford.....	Drs. West & Dewar; R. J. Henderson.	Action taken only on complaint.	Tuberculosis, 1 death....
Brunel.....	J. W. Hart, M.D.; H. Farnsworth.	Only when complaint is made.	Diphtheria, 8 cases, 1 death.
Bromley.....	A. J. Sparling, M.D.; Patrick Hart.	No; only when complaint is made.	Diphtheria, 4 cases; tuberculosis, 3 cases.
Cardiff.....	Robt. Caldwell, M. D.; A. W. Willis.	When complaint is made to Board.	Diphtheria, 10 cases, 1 death.
Cumberland.....	Jas Ferguson, M.D.; W. W. Dunning.	Action taken only when complaint is made.	Scarlatina, 20; diphtheria, 5 cases, 1 death; typhoid, 10 cases; tuberculosis, 4 deaths.
Crosby, South.....	D. A. Coon, M.D.; J. R. Dargavel.	No.....	.....
Charlottenburgh.....	A. Falkner, M.D; G. H. McGillivrey.	Yes, of cheese factories and slaughter houses, and in other cases; action taken on complaint.	Diphtheria, 20 cases; typhoid, 5 cases, 2 deaths, tuberculosis, 11 deaths.

TOWNSHIPS—Continued

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
.....		Yes	
Yes; house isolation; no hospital.	No	Yes	No
Yes: no isolation hospital.	Yes	Yes	No; no.....
Yes; as nearly as possible; no isolation hospital; free use of disinfectants.	Yes; has been satisfactory; two deaths have occurred during the year after its use.	Generally so; always so, if necessary.	No; no.....
Yes; on premises	No physicians report, and cannot give results.	Under supervision of attending physician.	No
No hospital ..	No	No occasion	No
Having no contagious diseases, no method was adopted.	No occasion	No occasion	No
No; under supervision of attending physician.	Yes; but not used this year.	No ..	No
Yes; isolated in their own homes.	Yes; all cases treated with antitoxin recovered; one patient not so treated died.	Ye	No
Yes; houses placarded; communication cut off.	Yes; results very satisfactory.	Not in all cases	No; no.
Yes; generally.....	Yes; successfully.....	Yes	No.....
Yes: no hospital.....	Yes; very best results follow its use; in early stage it is a specific.	Yes, by M.H.O	No.....
No hospital	Don't know	No necessity	No; no
Yes; in separate rooms; no.	Yes; very satisfactory....	Yes	No; no

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Bonfield.....	None.....	.....	.....
Burleigh & A.....	No.....	Wells.....	No; no.....
Brougham.....	None.....	Running springs.....	No; no.....
Beverly.....	Yes.....	Usually from rock-drilled wells, from 20 to 40 feet.	No; no.....
Bentinck.....	No.....	Wells.....	No.....
Burpee.....	Yes.....	Wells, 5 feet.....	No.....
Barton.....	Not yet.....	.....	No cases of tuberculosis; cow byres are inspected
Blandford.....	Yes.....	From wells.....	No; no; no.....
Brunel.....	No.....	Spring water.....	No.....
Bromley.....	No.....	Generally from wells, 12 feet.	No; no; not used.....
Cardiff.....	No.....	Wells.....	No.....
Cumberland.....	No.....	Wells; about 15 feet....	No tuberculosis has occurred.
Crosby, South.....	No.....	Wells; from 10 to 30 feet	No; no.....
Charlottenburgh.....	Yes; to physician.....	Wells; about 10 feet....	No.....

TOWNSHIPS — *Continued.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
One; not licensed ..	.....	.....	.....	.....
None; no	Removal by owner of property at his own cost.	No	None	No.
None.	No	No	None	No.
Four; 10; fed to pigs.	No	No	None	No.
One; no license; inspected by sanitary inspector.	No	No	None	No.
.....
13; not licensed	Used on land	No	None	No.
4; no .....	.....	.....	None	No.
.....
One; no; no special disposition is made	No	No	No	No.
None	Householders remove night soil and garbage.	No	None	No.
Two; not licensed; put on land; no inspection of carcasses by any officer.	None	None	None	No.
No licensed slaughter houses.	No	No	None	No.
Three; yes; buried; no, unless complaint is made.	Well looked after by householders.	No	None	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board.	Contagious diseases.
Collingwood	John Shultis, M.D.; Ed. Rorke.	Yes, once a year.	
Carrick	J. A. Wilson, M. B.; James Johnston.	Yes; repeated every year.	Typhoid, 3 cases, 1 death; tuberculosis, 1 case, 1 death.
Cambridge	W. E. Crain, M.D.; J. B. Sanche.	Only when complaint of nuisance is made to Board.	Diphtheria, 5 cases
Cockburn Island.	No M.H.O.; A. Monck.	Only when complaint is made.	
Clarence	N. DesKosies, M.D.; Joseph Minard.	Repeated every year; in spring and when complaint is made.	Scarlatina, 2 cases; diphtheria, 19 cases; typhoid, 23 cases, 8 deaths; tuberculosis, 4 cases, 2 deaths.
Chaffey	F. L. Howland, M.D.; W. Clarke.	Only on complaint.	None
Charlotteville	W. J. Innes, M.D.; John Machon.	Action taken only on complaint.	Tuberculosis, 2 cases.
Chapman.	J. S. Freeborn, M. D.; Joseph Wilson.		None.
Cavan	H. A. Turner, M. D.; Geo. Sootheran.	Only when complaint is made.	Tuberculosis, 2 cases, 2 deaths.
Cayuga, North	J. Baxter, M.D.; James Mitchell.	On complaint.	Diphtheria, 3 deaths; consumption, 4 deaths.
Cardwell	J. A. Morgan, M. D.; Mathew Wilson.	Action is taken on complaint.	Diphtheria, 3 cases.
Caldwell	No M.H.O.; O. Lafrance.	None.	None.
Carden	No M.H.O.; John Walsh	No	None.

TOWNSHIPS.—*Continued*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; families are isolated in their homes, under the supervision of the M.H.O. No hospital.	Yes; results are very satisfactory.	Yes	Yes
Yes; carried out in private houses.	Think it is; M.H.O. has used it in every case with good results.	Yes	No; no.....
Yes; usual methods; no ..	Yes; most satisfactory....	Yes	Yes; no; no.
No occasion .....	.....	.....	No; no.....
No	Yes; good results.....	No	No.....
Houses are isolated	Where used results were good.	Yes	No.....
Yes; no	Don't know	Yes	No.....
No occasion	No occasion	No occasion	Yes; no.....
Yes; isolated or sent to Peterboro' hospital.	Yes	Yes	No; no
.....	Yes	Yes	No.....
Yes; no hospital; isolated in their homes.	No	Yes	No; no
No hospital.....	No .....	.....	Yes, once or twice each year; no certificates required as yet.
Yes	No	Yes	No.....

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M.H.O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Collingwood.....	No.....	Wells; 10 to 30 feet....	No dairy cows.....
Carrick	No.....	Wells; don't know depth	No; tuberculin test not used; do not know of any cases having occurred.
Cambridge	No.....	Wells; 12 to 15 feet	No; don't know.....
Cockburn Island.....	No.....	A creek	No.....
Clarence	No.....	Wells; about 12 feet....	No.....
Chaffey	No.....	Wells and springs.....	No; no
Charlotteville	No.....	Wells and streams.....	No.....
Chapman	No.....	Wells and springs ...	No; no
Caven	Yes	Principally from wells; about 20 feet.	No.....
Cayuga, North	Yes .....	.....	No.....
Cardwell	Yes	Generally from springs..	No; no cows.....
Caldwell	Not except asked	Wells, 8 to 12 feet.....	None
Carden.....	No.....	Wells, from 12 to 20 feet.	No.....

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 68, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
Three under license; offal disposed of to the satisfaction of inspector; no inspection of carcasses.	No.	No.	None	No.
17; no license but must have approval of Board and comply with requirements; offal generally burned; no inspection of carcasses.	No.	No.	None	No.
Two; no; don't know; no.	No.	No.		No.
None.		None		No.
Three; no license; burned.	No.	No.	No.	No.
Three; inspected.		No.		No.
Don't know how many, but all are inspected.	No.	No.	None.	No.
None.	Each resident removes night soil and garbage at his own expense.	No.	None.	No.
Two; no; boiled and fed to hogs.	No.	No.	No.	No.
None				None.
None	No.	No.	None.	No.
None	No.	No.	None.	No.
None	No.	No.	None.	No.

TOWNSHIPS.—Continued.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Caledon	Jas. Algie, M. D.; D. Kirkwood.	Action taken on all cases deemed necessary, either on receipt of complaint, report of physician, or when anything comes under the notice of any member of the Board. The sanitary inspector or M. H.O. according to the nature of the case takes action.	Scarlatina, 4 cases; diphtheria, 5 cases; typhoid, not reported; tuberculosis, not reported.
Crowland	S. H. Glasgow, M.D.; W. D. Misener.	Action taken only when complaint is made.	Scarlet fever, 1 case.....
Clarke	No M. H. O.; John Rickaby.	No; inspection by members of Board in districts allotted.	Scarlatina, 5 cases; diphtheria, 1 case.
Carlow	No M. H. O.; W. D. Parkhurst.	No; no; only on complaint.	None reported... ..
Cartwright	No. M. H. O.; William Lucas.	General sanitary inspection repeated.	Typhoid, 1 case.....
Colborne	A. Taylor, M.D.; F. W. McDonagh.	No; no; yes.....	None
Canborough	C. J. Kelly, M.D.; N. R. Teeft.	Only when complaint is made to Board.	Tuberculosis. 1 case.....
Christie	No M. H. O.; Wells Thompson.	Action taken only when complaint is made.	None.....
Calvin	M. James, M.D.; W. T. Gale.	Action taken on complaint.	None.....
Colchester, North	J. E. Jenner, M.D.; A. C. Atkinson.	No general inspection; action only taken when complaint is made.	Diphtheria, 2 cases, 1 death; typhoid, 1 case, 1 death; tuberculosis, 2 cases, 2 deaths.
Carling	J. R. Stone, M.D.; James Crerar.	Action taken on complaint.	None.....
Caradoc	M. Bice, M.D.; C. H. Lockwood.	Yes; three times a year.	Scarlatina, 41 cases, 3 deaths; diphtheria, 3 cases; typhoid, 2 cases, 1 death; tuberculosis, 1 case, 1 death.

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? (Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; isolation is carried out and sanitary policeman appointed where necessary; placarding the door, the exclusion of children from school, and family prevented from mingling with the public.	Not in common use; always keep a fresh supply on hand.	Yes; unless done and certified by attending physician.	No; no
No isolation hospital; patients kept in room and disinfectants used.	No	Carried out under attending physician's instructions.	The Board acts when called upon.
Isolated at houses; houses placarded; no.	No	Yes, by physicians in charge.	Yes, at least once a year.
Yes, where necessary; no hospital.	No	No.....	No.....
Isolation systematically carried out by placarding the premises and notifying school teachers; no isolation hospital.	Physicians are supplied with anti-toxine.	Yes, by attending physician.	No; no
No.....	Yes, when required.....	Don't think so.....	No; no
.....	Yes .....	.....	No; no
Houses are placarded.....	Don't know	Yes	No; no
.....	.....	.....	No.....
Placarding and quarantine of infected houses; no hospital.	Don't know	No.....	No; no
.....	.....	.....	No; no
Yes; no isolation hospital; methods: placarding, quarantining, disinfecting.	Yes; the 3 cases of diphtheria were treated with anti-toxine.	Yes, by formaline lamp.	No; no

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M.H.O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Caledon	Yes, freely	Wells and springs.....	No; not that we know of.
Crowland	Don't know	Wells; generally about 25 feet.	Don't know
Clarke	To physicians only.....	Wells; water supply good	No; no
Carlow	No.....	Springs and wells; about 30 feet.	No; no
Cartwright	No.....	Wells; about 30 feet....	No; no cases of tuberculosis.
Colborne ..	No.....	Wells; 30 to 50 feet....	No, no
Canborough	No.....	.....	No; no
Christie	No.....	Wells	No; no cases
Calvin	No.....	.....	No.....
Colchester, North.....	No.....	Surface wells about 12 feet; bored wells, 150 feet.	No; no cases; tuberculin not used so far as I know.
Carling	No.....	Wells, from 2 to 12 feet.	No; no
Caradoc	Yes	Artesian wells, 15 to 20 feet.	Have no dairies in township; had no cases, sanitary inspector makes regular visits to cheese factories, etc.

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made, How is the cost calculated?	Is there a public sewage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same
Six; no license fee exacted; inspection made; offal buried; no inspection of carcasses.	No regular system; the Board issues notices every spring calling for the cleaning up of wells, privies, cellars and cess-pools; each householder held responsible for the sanitary condition of his premises.	No.....	One tannery, kept in good condition.	No.
No regular slaughter houses.	Removed when necessary; buried generally.	No.....	None.....	No.
Three; no; fed to hogs or buried; no.	Householders are responsible for removal.	No.....	None.....	No.
None.....	No.....	No.....	None.....	No.
None.....	No.....	No.....	None.....	No.
None.....	None.....	.....	None.....	No.
Three; no; no....	.....	No.....	.....	No.
One.....	No.....	No.....	None.....	No.
None.....	.....	.....	None.....	No.
None.....	.....	.....	None.....	No.
.....	.....	.....	None.....	No.
Three; yes; burnt; no.	No.....	No.....	None.....	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Chandos.....	Jno. Calwell, M.D.; J. W. Ratcliff.	Only when complaint is made.	None.....
Caistor	R. H. Delemater, M.D.; W. J. Warner.	Yes; action taken when complaints are made to Board.	Tuberculosis, 1 case, death.
Cramahe	R. W. Stinson, M.D.; R. B. Walt.	No; action taken when complaint is made to Board.	Typhoid, 1 death; tuberculosis, 1 death.
Carnarvon.....	None.	No.....	None.....
Culross	— Gillies, M.D.; Chas. Button.	Inspection made at intervals.	Diphtheria, 1 case; typhoid, 2 cases, tuberculosis, 8 cases.
Day, Gladstone, etc.....	No M.H.O.; W. Harris.	No	None.....
Drummond.....	No. M.H.O.; Thos. B. Moore.	Only when complaint is made.	None... ..
Dummer	J. W. Couch, M.D.; B. James, jun.	No; no; yes	Scarlatina, 3 cases; diphtheria, 2 cases; tuberculosis, 2 cases and 2 deaths.
Dungannon	A. S. Leavitt, M.D.; B. Spurr.	No.....	None... ..
Dunn	G. A. MacCallum, M.D.; David Lyons, jun.	No; no	Diphtheria, 1 case.....
Dunnet and Rutter.....	H. Irwin, M.D.; J. T. Froysell	Yes	Typhoid, 4 cases, 1 death
Dysart	Wm. Gillies, M.D.; Wm. Prust.	Yes; when complaint of nuisance is made to Board.	None.
Dumfries, South.....	J. L. Addison, M.D.; Wm. Fleming.	Yes; twice and when complaint is made.	Scarlatina, 4 cases; typhoid, 3 cases, 1 death; tuberculosis, 2 cases, 2 deaths.
Denbigh, Abinger and Ashby	Chas. D. Doig, M.D.; Paul Stein.	.....	None.....
Dalhousie and N. Sherbrooke	A. Downing, M.D.; Walter Geddes.	No; no; only when complaint is made.	Tuberculosis, 2 cases, 2 deaths.

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
No isolation hospital exists; patients carefully guarded in their own homes.	It is.....	Yes	No.....
Yes, by placarding; no hospital exists.	Yes	No occasion	No; no
Yes; isolated in their own homes; no hospital.	Don't know; no cases existed.	No contagious diseases existed.	No; no
Yes	No.....	Yes	No.....
.....	.....	.....	No.....
.....	.....	.....	No Board
No; no hospital	Not in common use	Think not.....	No; no
Yes, placard	Yes; successful	Yes	No no
Yes, where required.....	Yes; good results	No.....	No.....
Yes, by attending physician.	Yes; good results	No; the physician in attendance looks after disinfection.	No; no
Yes	Yes	Yes	No.....
Yes	Not been used.....	Yes	No; no
Yes; all communication with family shut off; after recovery or death place disinfected before allowing communication.	No diphtheria	Not always	Yes; no.....
Not necessary	No diphtheria .....	.....	No.....
Houses placarded and patient isolated; no hospital.	Don't know.....	No; just under orders from M.H.O.....	No; no

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Chandos	No.....	From wells	None.....
Caistor.....	Yes	Artesian wells.....	No ; no ; no cases have been reported.
Cramahe	No.....	Don't know	No ; no
Carnarvon.....	No.....	.....	No.....
Culross.....	No.....	Wells, from 20 to 60 feet.	No.
Day, Gladstone, etc.....	No.....	Schools generally have small wells.	No.....
Drummond.....	Yes	Wells, 36 feet deep in solid rock.	No inspection of dairy cows.
Dummer	Yes	Wells	No ; no ; no.....
Dungannon	No.....	Wells, 12 feet	No.....
Dunn	No.	Wells, 12 to 24 feet.....	No.....
Dunnet and Rutter.....	No.....	Wells, 30 feet.....	No.
Dysart	No.....	Wells and springs.....	No ; no
Dumfries, South.....	Yes, to M.H.O. only....	Wells from 10 to 20 feet deep.	Yes ; no.....
Denbigh, Abinger and Ashby	No..	Wells almost exclusively, 10 to 20 feet deep.	No....
Dalhousie and N. Sherbrooke	No.....	Springs and wells, about 15 feet deep.	No ; no

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what portion of houses to which is connected with public sewers?	State No. and kind of noxious trades. (See sec 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, and results of same.
None	No systematic removal.	No.	None	No.
Seven; no; fed to hogs.	Yes, by householders	No.....	None	No.
None.....	No, not necessary...	No.....	None	No.
None.....	No.....	No.....	None	No.
Five; used once or twice a week for farmers' use.	.....	.....	.....	.....
None.....	No.....	.....	None	No.
One; no license; offal is fed to hogs.	No systematic removal of night soil; no cost.	No sewerage system.	None	No.
Two; yes; buried; no.	No.....	No.....	None	No.
None in municipality	No.....	No.....	None	No.
No.....	No.....	No.....	None	No.
No.....	Yes	No.....	None	No.
None.....	No.....	No.....	None	No.
Four; yes; boiled; no.	No.....	No.....	None	No.
None.....	Removed by householders.	No.....	None	No.
None; no.....	No.....	No.....	None	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Darlington	J. C. Mitchell, M.D.; H. Elliott, jun.	Yes; once each year and when complaint is made.	Scarlatina, 10 cases; diphtheria, 9 cases, 2 deaths.
Draper	No H. M. O.; David Cairnes.	.....	None.....
Dalton	No. M.H.O.; A. Montgomery.	.....	Typhoid, 1 case.....
Dorchester, North.....	A. Graham, M.D.; W. B. Lane.	Action taken when complaints are made to Board.	Scarlatina, 10 cases, 2 deaths; diphtheria, 1 case; typhoid, 6 cases, 1 death; tuberculosis, 3 cases, 2 deaths.
Douro.....	John R. Fraser, M.D.; Wm. O'Brien.	No; no; only when complaint is made.	Scarlatina, 11 cases, 1 death; typhoid, 1 case; tuberculosis, no record kept.
Delaware.....	T. H. Mitchell, M.D.; W. C. Harris.	Yes; in the village of Delaware; twice a year and action taken when complaint is made.	Diphtheria, 11 cases, 2 deaths; typhoid fever, 5 cases, no deaths.
Downie	J. J. Paul, M. D.; P. Smith.	No general inspection; action taken only when nuisance complained of, except cheese factories and piggeries, etc.	Scarlatina, 5 cases; diphtheria, 3 cases, 1 death; typhoid, 2 cases; tuberculosis, 2 cases, 2 deaths.
Egremont	T. J. Sneath, M. D.; David Allan.	Action taken only when complaint is made.	Diphtheria, 2 cases, 1 death; tuberculosis, 4 cases, 4 deaths.
Elmsley, S	Wm. Pratt, M.D.; John Rabb.	No; no; action taken on complaint.	None
Ernestown.....	J. E. Mabey, M.D.; E. O. Clarke.	Yes; only on complaint or suspicion of filth.	Typhoid, 10 cases.....
Edwardsburg	S. C. McLean, M.D.; A. Carmichael.	Action taken when complaint is made to board.	Diphtheria, 1 case; tuberculosis, 6 cases.

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes, as far as possible; by isolating in private rooms where possible, and such means as attending physician may devise.	No; used by one or two; results good when used early; in one case symptoms very favorable for a time, succumbed afterwards to heart failure; two other cases disclosed weakness of heart after its use.	No, not always.....	No; no
None required.....	.....	Yes, when required.....	No.....
No.....	Yes	Yes	No.....
Yes; patients separated from all others; children kept from school; no hospital.	Yes; results generally favorable.	Yes	No; no
So far as possible in patients' own houses, which are placarded and disinfected.	No cases.....	Disinfection is carried out; but not exactly under personal supervision, but houses are inspected by M.H.O. before placard is removed.	No.....
Yes; quarantine the house; no hospital.	Yes; no deaths occur when used.	Yes	Yes; no, vaccination is being sadly neglected.
Patients isolated in homes, inmates quarantined, and an officer appointed to look after their wants.	I think it is in general use; cannot give results.	Yes, by M.H.O. who generally does the work with a formaldehyde generator.	Only once a year; no...
As well as circumstances will permit: houses placarded; no hospital.	Don't know	No; only by physicians in attendance.	No; no
No hospital	Yes	No diseases reported....	No; no
Yes; isolated in houses or Kingston hospital.	Yes; good	Usually	No; no
Yes, as far as possible; no hospital.	Yes; results good	No	No; no

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Darlington	No	Wells, 15 to 60 feet ..	No ; no
Draper	No	Wells	No inspection of dairy cows.
Dalton .....	.....	Springs	No
Dorchester, North	Yes	Wells, 30 feet	No ; no
Douro .....	.....	Wells, about 20 feet ..	No
Delaware	Yes	Wells, 15 to 20 feet ..	No
Downie	No	Wells, from 16 to 30 feet.	No ; no
Egremont	Physicians supplied only	Wells and springs	No
Elmsley, S	No	Wells and springs ; 12 to 30 ft.	No ; no
Ernestown	Yes	Wells ; 20 ft	No ; no ; no
Edwardsburg	No	Wells ..	No inspection of dairy cows ; no cases of tuberculosis.

TOWNSHIPS.—*Continued.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost regulated?	Is there a public sewerage system? If so, what portion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act), How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, and results of same.
Two; no; don't know; no	No.....	No.....	None	No.
None	No.....	No.....	None	No.
None	No.....	No.....	None	No.
Seven; no; cooked and fed to hogs; no.	No.....	No.....	None	No.
One; no; fed on premises to hogs; no.	No.....	No.....	None	No.
Two; kept in good sanitary condition; offal fed to hogs; no inspection of carcasses.	No.....	No.....	None	No.
One; yes; generally boiled and fed to hogs; no.	No.....	No.....	None	No.
None	By householder	No	None	No.
One; offal buried ..	No	No	None	No.
Five; visited by inspector; fed to pigs; no.	No	No	None	No.
Two; no license; no inspection of carcasses.	.....	No	None	No.

TOWNSHIPS.—*Continued.*

Name of Municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board.	Contagious diseases.
Elmsley, N	No M. H. O.; P. McKinley.	Only when complaints are made.	Scarlatina. 1 case; typhoid, 2 cases.
Elderslie	No M. H. O.; J. C. McIntyre.	Yes	Tuberculosis, 3 cases; 3 deaths.
Eastnor	J. G. Sloane, M. D.; Chas. W. W. Dalton.	Only on complaint	Tuberculosis, 1 case; 1 death.
Ekfrid	L. J. A. Hyttenranch, M.D.; H. McFarlane.	Action taken when complaints are made.	Scarlatina, 2 cases; diphtheria. 1 case; typhoid-1 case.
Eldon	J. F. Ross, M.D.; John Jackson.	Action taken only when complaint of nuisance is made to Board.	Tuberculosis, 5 deaths ..
Easthope, S	R. Whiteman, M. D.; Valentine Stock.	No; no; action taken when complaint is made.	Scarlatina, 2 cases, 1 death; diphtheria, 2 in one family, 2 deaths; Tuberculoses, 6 cases, 6 deaths.
Elma	A. S. Langrill, M.D.; Thos. Fullarton.	When complaint is made.	Scarlatina, 60 cases, 5 deaths; typhoid, 3 cases; tuberculosis, 4 deaths.
Ennismore	No M. H. O.; J. F. Collins.	Action taken only upon complaint of nuisance.	Typhoid, 2 cases; tuberculosis, 3 deaths.
Derby	C. E. Barnhart, M.D.; William Beaton.	Yes; once a year and when complaint is made of any nuisance.	Diphtheria, 1 case
Dumfries, N	Adam Thomson, M.D.; Joseph Wrigley.	Slaughter houses and cheese factories are inspected regularly, and other inspections made when called upon.	Scarlatina, 2 cases; diphtheria, 4 cases; typhoid, 2 cases; tuberculosis, 2 deaths.

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is Diphtheria Anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; no hospital	No cases of diphtheria	Yes	No; no
.....	No	Yes, when cases arise	Yes
Yes. . . . .	.....	Yes	Yes; no
Scarlatina and diphtheria patients are isolated; houses placarded which is found to be of tremendous influence; no isolation hospital; typhoid patients are left to attending physician with suggestions.	Yes, by M. H. O.: only case used appeared in last year's report; fairly successful.	Yes; in scarlet fever and diphtheria.	No
No	Yes	In some cases	No; no
Isolation as directed by attending physician and M. H. O.; no hospital.	No: M. H. O. used it in some cases, and for results see his report.	Yes; under supervision of M. H. O.	No; no
No; no isolation hospital .	Not in use	Yes; under supervision of M. H. O.	No; no
No; none; no	No	No	No
Yes; by placarding the house; no hospital.	.....	.....	Yes; once a year; no
No; some cases of diphtheria treated in Galt general hospital.	Yes, was used in all 4 cases, good results.	Was in two cases; used the appliance of Galt B. of Health in other cases the physician in charge attended to it.	No; only when some one thinks it necessary; no

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teacher and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Elmsley, N	No	Wells	No ; no
Elderslie	Yes .....	.....	No
Eastnor .....	.....	Wells ; good water	No
Ekfrid	Yes	Surface wells and some artesian wells, bored this year.	No
Eldon	No	From wells generally ; 15 to 50 feet deep.	No
Easthope, S'	Yes	Ordinary wells ; average 24 ft.	No ; there are some herds of cattle in which it has been found ; cannot say.
Elma	No	Wells ; 25 to 100 ft	No ; no ; no
Bunnismore	No	Wells ; 10 to 40 ft	No ; no ; no
Derby .....	.....	.....	.....
Dumfries, N	No	Springs, wells ; generally deep.	Sanitary inspector looks after the cases in a general way ; don't know of any.

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what portion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under the Public Health Act? State in detail the nature of the case, and results of same.
One; no inspection.	No	No	Slaughtering of animals.	No.
Three; inspected; not licensed, simply used as farmers' beef rings; slaughtering about once a week.	No .....	.....	None	No.
Two; kept in good condition.	No	No	None	No.
Four. not licensed; disposal of offal not inspected; no inspection of carcasses.	.....	.....	None	No.
One; no systematic inspection.	No	No	None	No.
Five; not licensed; mostly fed to hogs or deposited on manure pile; no systematic inspection of meat.	No	None	None	No.
Five; not licensed; some offal boiled and fed to hogs; no systematic inspection of carcasses.	No systematic removal.	No	None	No.
None; no; none; no.	No	No	None	No.
Three; yes; no.....	.....	.....	.....	No.
Eight; yes; boiled and fed to hogs; no.	People are instructed to clean up once a year.	No	None	No.

TOWNSHIPS.—Continued.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Dawn	—Galbraith, M.D.; A. P. Chalmers, M.D.; J. Webster.	Only on complaint	Scarlatina, 25 cases; diphtheria, 15 cases, 5 deaths; typhoid, 3 cases; tuberculosis, 3 cases, 3 deaths.
Dover	J. S. Ager, M.D.; John Walsh.	Action is only taken when complaint is made to Board.	Diphtheria, 20 cases, 1 death; typhoid, 3 cases, 1 death; tuberculosis, 3 cases, 1 death.
Dereham	H. Minsall, M.D.; Alex. Bell.	Cheese factories, slaughter houses and schools are inspected at intervals; other premises inspected when complaint is made.	Scarlatina, 2 cases, 1 death; diphtheria, 20 cases, 2 deaths; typhoid, 2 cases; tuberculosis, 3 cases, 2 deaths.
Darling	No M. H. O.; J. H. Rintoul.	Only when complaint is made.	Diphtheria, 1 case
Euphrasia	A. L. Danard; A. L. Curry.	Only when complaint is made.	Scarlatina, 1; diphtheria, 1; typhoid, 1; tuberculosis, 1 case, 1 death.
Emily	G. S. Cameron	No	Typhoid, 1; tuberculosis, 2 cases, 2 deaths.
Elizabethtown	—Sharpe, M.D.; J. B. Barry.	No; only when complaint is made.	.....
Elzevir & G.	—Harper, M.D.; R. W. Miller.	Action taken on complaint.	Diphtheria, 10 cases
Essa	J. Wesley Norris, M.D.; R. T. Banting.	Only when complaint is made.	None reported
Etobicoke	Emerson Bull, M.D.; A. McPherson.	Yes; yes; action also taken when complaint is made.	Scarlatina, 4 cases; diphtheria, 5 cases.
Euniskillen	John Dunfield, M.D.; Geo. V. Bryant.	General sanitary inspection on complaint to any member of Board	Scarlatina, 5 deaths; diphtheria, 2 deaths; typhoid, 1 death; consumption, 5 deaths.

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; we employ sanitary police; no hospital.	No	Yes; under M.H.O.	Yes; no
When possible patient is placed in room in upper story of dwelling, furniture and clothing removed, a sheet hung over the door, saturated with carbolic solution.	Yes; results good	Yes	No; no
No; no hospital; isolation has only been practised in Scarletina and diphtheria; no attempt has yet been made to isolate patients suffering from tuberculosis.	Anti-toxine has been used in all severe cases with the most gratifying results.	Only partially; outside physicians don't want the Board to interfere.	Yes; no
No method adopted	Used in one case with good results.	Yes	No; no
Isolated in house	Yes; two benefited; two uncertain.	Yes; by physician attending patient.	No
No	Can't say; no cases reported.	No	No; no
No	Don't know	Yes	No
Yes	Yes; good results	Yes	No
No contagious diseases except typhoid.	No occasion for its use...	No	No; no
Yes; no isolation hospital, but isolated as well as possible in their own homes.	Yes, when thought necessary.	Yes	No no
.....	Yes; good results	Yes	Board acts on complaint; does not require certificate.

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supplied used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Dawn	No; the physicians notify the secretary or chairman.	Wells; from 20 to 60 ft.	No
Dover.....	No	Wells; 12 to 14 ft.	No; none to my knowledge.
Dereham	Yes	Wells; about 25 ft.	No systematic inspection of dairy cows; one herd of dairy cows has been pronounced infected; tuberculin test was used and only two of the herd did not respond.
Darling	No	Springs	No; no.....
Euphrasia.....	No	Wells; average 25 ft....	No
Emily.....	No	Wells; 15 to 20 ft.	No
Elizabethtown.....	Yes	Wells .....	.....
Elzevir & G.....	No	Wells; average 10 ft....	No
Essa	None ..	Wells	No; no; not used
Etobicoke	No	Wells	No; no.....
Enniskillen	Yes	Artesian wells; 60 to 90 ft. deep.	No inspection; no tuberculosis to my knowledge.

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, and results of same.
None			None	No.
N	No	No	None	No
Four; yes; offal consumed by hogs; no systematic inspection of carcasses.	No attempt at removal.	None	None	No.
None; no	No	No	None	No.
One; no license; no inspection.	No	No	None	No.
One; cannot say . . .	No	No	None	No.
.		No	None	No.
None	No	No	None	No.
One	Anything done is by householder.	Not a public one . . .	The most injurious is the sale of noxious liquors, Canada's curse.	No.
Ten; no; used for fertilizing purposes; no.	Yes, as regards Long Branch.	Yes, at Long Branch	None	No.
Six; offal fed to hogs.	No	No	None	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Name of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Erin	Thos. Young.....	No general sanitary inspection.	Diphtheria, 1 case, 1 death; tube culosis, 1 case, 1 death.
Esquesing	No M. H. O.; G. H. Kennedy.	General inspection once a year; after that action taken when complaint is made.	Scarlatina, 3 cases; typhoid, 1 case, 1 death; tuberculosis, 1 case, 1 death.
Fitzroy	No M.H.O.; A. Murphy .....	.....	Scarlatina, 18 cases; diphtheria, 2 cases, 1 death; tuberculosis, 1 case, 1 death.
Ferris	J. B. Carruthers, M.D.; M. Nelan.	Action taken on complaint of nuisance.	Chicken pox, 3 severe cases.
Fredericksburgh, N.	— Ward, M.D.; A. B. Sexsmith.	Action taken on complaint; cheese factories and school houses are regularly inspected.	Diphtheria, 2 cases; typhoid, 2 cases.
Floss	J. B. H. McClinton, M.D.; C. S. Burton.	Only when complaint is made.	Scarlatina, 1 case; diphtheria, 6 cases; tuberculosis, 4 cases, 4 deaths.
Flamboro, E	D. A. McClenahan, M.D.; John Bremner.	Yes, when required; No; when complaint is made.	.....
Fullarton	Wm. Hockney, M. D; John Wilson.	Yes; yearly.....	Typhoid, 7 or 8 cases reported, 2 deaths; tuberculosis, 1 case, 1 death.
Fenelon	J. W. Ray, M.D.; J. B. Powels.	Only when complaint is made.	Typhoid, 1 case; tuberculosis, 1 case.
Faraday	A. T. Embury, M.D.; J. Bremner.	Action taken on complaint.	None reported....
Fredericksburg, S	— Leonard, M.D.; W. H. Rickely.	Only on complaint.....	.....
Grey	M. Ferguson, M. D.; Wm. Spence.	Action taken only when complaint is made to Board.	None

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
.....	Don't know	No	No
Yes; by placarding; no hospital.	.....	No; the physician in attendance looks after it.	This is left to public school inspector.
Patients are isolated in their own houses; no hospital.	Yes; very successful	Yes	No
No isolation hospital.....	Yes	Yes	No; no
Yes; by placarding..	Yes	Yes	Yes
Yes; placard houses; no hospital.	Yes; very satisfactory ...	No, but under supervision of attending physician.	No; no
In this rural community it is not considered necessary; no isolation hospital.	Yes; with very satisfactory results.	The M. H. O. attends to this matter.	No; no
Yes, when reported; no hospital.	No diphtheria.....	Yes	Yes; no
Yes; patients and inmates isolated and some one appointed to wait on them; no isolation hospital.	Yes; good results	Not strictly	No
No.....	No	No	No
Yes; all persons on the premises at the time disease breaks out are strictly prohibited from mingling with the public till disease is completely stamped out.	Yes; no cases during the year.	Yes	Yes
No; none; no hospital exists.	No cases of diphtheria in township during the year.	No	Board inspects the schools once a year; no certificate.

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Erin	No	Wells : about 25 ft.	No
Esquesing	No	Generally from wells.	No
Fitzroy	Supplied to physicians..	From wells	No ; no
Ferris	No	Creeks and surface water.	No
Fredericksburgh, N.	Yes	Wells	No
Floss	Yes	Artesian and other wells, average about 14 ft.	No ; no
Flamboro, E	No	Wells, 15 to 30 ft	No
Fullarton	No	Wells, from 18 to 40 ft.	No ; no ; no
Fenelon	No	15 to 30 ft	No
Faraday	No	Wells, usually about 12 to 30 ft.	No ; none reported
Fredericksburgh, S	Yes	Wells, 10 to 20 ft	No ; no cases
Grey	No	Wells, 12 to 16 ft	No ; no

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
One; no; no	No	No .....	.....	No.
Two; no .....	.....	.....	.....	No.
None	Yes	No	None	No.
None	No	No	None	No.
2; yes	No	No	None	No.
3; no; no	No	No	None	No.
2 or 3; cannot say ..	No	No	None	No.
2 small ones; offal fed to hogs or buried; no inspection of carcasses.	No	No	None	No.
Not under municipal supervision.	No	No	No	No.
None	No	No	No	No.
None	No	No	None	No.
1 slaughter house; kept in sanitary condition; buried; no.	No	No	1 slaughter house by permission.	None.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Grantham	— Merritt, M.D.; L. S. Bessey.	When complaint is made.	Tuberculosis, 3 cases, 3 deaths.
Gower, N	F. B. Harkness, M.D.; James E. Craig.	No; action taken on complaint.	None
Gwillimbury, W.	No M. H. O.; Z. Evans.	Only when complaint is made.	Diphtheria, 1 case, 1 death.
Garden Island	R. W. Garrett, M.D.; R. Raymond.	Yes; repeated at intervals during the year.	None
Galway and Cavendish ..	No M. H. O.; P. Collins	No action	Tuberculosis, 2 cases, 2 deaths.
Grimsby, S.	N. P. Henning, M.D.; Edward Irvine	Yes; yes; only when complaint is made to Board.	None
Goulbourn	G. L. Richardson, M.D.; Adam Abbott.	Only on complaint	Scarlatina, 5 cases; diphtheria, 5 cases, 1 death; typhoid, 7 cases, 1 death.
Grimsby, N	James W. Alway, M.D.; W. H. Nelles.	No; only when complaint is made.	Typhoid, 4 cases; tuberculosis, 1 case.
Gower, S.	No M. H. O.; E. Pelton.	No; action taken only when complaint is made.	None
Gordon	No M. H. O.; Wm. Cain	Only on complaint	None
Gainsboro'	J. W. Colver, M.D.; S. Kennedy.	Action taken only when complaint is made to Board.	Scarlatina, 5 cases; typhoid, 2 cases; tuberculosis, 2 cases, 1 death.
Glanford	C. Smith, M.D.; W. M. Calder.	Inspection is only made on complaint or on suspicion of unsanitary conditions.	Diphtheria, 3 cases; typhoid, 1 case, 1 death; consumption, 1 death.
Garafraxa, E.	No M. H. O.; John Preston.	When complaint is made	None
Glenelg	James Dun, M.D.; J. S. Black.	Action only on complaint	Scarlatina, 1 case; tuberculosis, 3 cases, 3 deaths.

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
No hospital; houses are placarded.	Don't know	No	No; no
No; no systematic method adopted.	No diphtheria reported....	Never has been.....	No; no
Isolation is attended to by physician in attendance; no hospital.	Think physicians keep a supply on hand.	No	No
Yes; all cases removed to hospital at Kingston.	.....	Yes .....	.....
No	No .....	.....	No
Patients not taken to separate building; isolated in their own dwelling.	Anti-toxine used in some cases; results seem to be good.	No	No, inspected when complaints are made.
Yes; principally farm houses; no hospital.	Yes; good	Yes	No; no
Placard houses; no hospital.	It has been; with satisfactory results.	It is.....	No
No	Cannot say.....	No	No; no
No contagious diseases	No .....	.....	No
No	No	No	No; no
Isolation has been in charge of medical attendant.	It is used and well spoken of by physicians.	No, under medical attendant.	No; no
Yes, when a case occurs....	No	Yes	No
Yes; by placarding and instructions from physician in attendance.	Not that we know of.....	Yes	Only in case of complaint; no

TOWNSHIPS.—*Continued*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the sources of water supplied used on the premises? If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Grantham	No	Wells, from 20 to 60 ft ..	No ; no
Gower, N	No	Wells, 12 to 15 ft. in clay, 30 to 40 ft. in gravel.	No ; no ; test made and no cases reported.
Gwillimbury, N	No	Wells, from 20 to 40 ft ..	No ; never knew of a case in this township.
Garden Island.....		River St. Lawrence.....	Yes ; no cases of tuberculosis have occurred this year.
Galway and Cavendish	No		No
Grimsby, S.....	No	Wells	No ; no ; not used.....
Goulbourn.....	No	Wells	No ; no ; no
Grimsby, N	No	Wells, usual depth 25 ft.	No ; no
Gower, S	No	Wells	No ; no
Gordon	No	Wells, 10 to 20 ft	No ; no cases.....
Gainsboro'.....	No ; yes.....	Wells, 15 ft	No ; none ; no
Glanford ..	Some forms have been supplied to physicians.	Wells, from 16 to 40 ft., drilled wells, about 100 ft.	No ; no cases of tuberculosis and no test.
Garafraxa E.....	No	Wells, about 30 ft	No
Glenelg	Yes	Generally from springs and wells ; water is first class.	No dairy within the municipality ; cases of tuberculosis unknown here.

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No and kind of noxious trades. (See Sec. 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, and results of same.
6; not licensed, but kept in sanitary condition.	No	No	None	No.
1; no license; no system.	No	No	1 slaughter house...	No.
None	No	No	None	No.
No slaughter houses in municipality.	All garbage and night soil removed by householders under supervision of sanitary inspector.	No	None	No.
None	No	No	None	No.
None; don't know; no.	Not systematic, but is all removed.	No	None	No.
None	No	No	None	No.
2; not licensed	No	No	2 slaughter houses ..	No.
None	None	No	None	No.
None	No system of removal.	No	None	No.
4; no; fed to hogs.	No	No	None	No.
Several; not licensed but permitted while kept in sanitary condition; offal is usually boiled and fed to pigs; no inspection.	No	No	Slaughtering of animals.	No.
No	No	No; district is a rural one.	None	No.
None .....	.....	.....	None	No.

TOWNSHIPS—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? Or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Georgina	C. T. Noble, M.D.; Donald Ego.	Action taken when complaint is made.	Diphtheria, 1 case; tuberculosis, 1 death.
Garafraxa, W	J. Dow, M.D.; Jas. Kennedy.	Yes; inspection once yearly; action taken at other times when complaint is made.	Typhoid, 2 cases; tuberculosis, 3 cases.
Glamorgan	No M. H. O.; D. Williams.	No; no; action taken only when complaint is made.	None
Gwidimbury, E	No M. H. O.; A. J. Hughes.	Action promptly taken..	Scarlatina, 17 cases; diphtheria, 44 cases, 1 death; typhoid 15 cases, 1 death; consumption, 5 deaths.
Grattan	M. J. Maloney, M.D.; Wm. Gorman.	Action taken only when complaint of nuisance is made.	Diphtheria, 5 cases; tuberculosis, 4 cases, 4 deaths.
Greenock.....	— Morrison, M.D.; J. W. McNab.	Yes; yes; inspection made regularly every year and prompt action taken when complaint is made.	Diphtheria, 6 cases, 3 deaths; typhoid, 1 case.
Gosfield, N	J. W. Brien, M.D.; Isaac Jackson.	No; action taken when required.	Diphtheria, 7 cases; tuberculosis, 2 cases.
Guelph.....	No M. H. O.; J. McCorkindale.	Yes; yes; yes	Scarlatina, 2 cases; typhoid, 1 case.
Goderich	J. B. Whitely, M.D.; N. Sturdy.	At intervals....	None
Gwillimbury, N	No M. H. O.; Henry Sennett.	No.....	Scarlatina, 6 cases; diphtheria, 20 cases, 4 deaths.
Gloucester	J. F. Argue, M.D.; H. B. Billings.	Inspection of slaughter houses and piggeries.	Diphtheria, 8 cases, 3 deaths.
Gosfield, S	Wm. Mackenzie, M.D.; G. W. Coatsworth.	Action taken only when complaint is made.	Scarlatina, 20 cases; diphtheria, 36 cases; tuberculosis, 5 cases.

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-t-xine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes, under attending physician's instructions.	No	Either a member of Board or attending physician disinfects.	No; no
Yes; no isolation hospital; patients separated from other members of the family in upper room where possible; free ventilation and disinfectants used.	Yes; has not been required this year.	No	Yes; no
No; house is isolated as soon as report is received from physician in attendance and messenger appointed.	Do not know	Yes	No; no
Yes; under direction of attending physician.	Used largely by one physician; out of 44 cases only 1 death occurred.	Yes, under direction of a physician.	No; no
Yes; no isolation hospital.	Generally used; with satisfactory results.	Yes	No; no
Yes; placarding house and isolation strictly enforced; no isolation hospital.	Yes; cannot give result of treatment.	Yes	Yes; no
Yes; quarantine and placard.	Yes; favourable.....	Yes	Yes
Yes; isolated in their own homes or sent to isolation hospital in Guelph city.	Yes; results reported good.	Yes	Yes; yes
No	Don't know	Yes	No
Yes; by having houses quarantined; no hospital.	Yes; claimed by some to be a sure remedy if administered in time.	Sometimes	No
Yes .....	.....	Yes .....	.....
No	Yes; with good results, no deaths occurring.	Yes	No

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases applied?	Give the source of water supplied used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Georgina	Yes .....	.....	No
Garafraxa, W	Yes	Wells and springs, wells about 25 ft.	No dairy in the municipality; no tuberculosis occurred to my knowledge.
Glamorgan	No	Wells, about 6 ft.	No
Gwillimbury, E	Supplied to medical men.	Wells, average about 30 ft.	No cases reported in this township.
Grattan	No, not thought necessary.	Ordinary wells	No; no
Greenock	Yes	Wells, average about 18 ft	No
Gosfield, N.	Yes	Wells	Yes
Guelph	Yes	Wells, 6 to 12 ft	No
Goderich	No	Wells	Don't know
Gwillimbury, N	Physicians only	Wells	No
Gloucester .....	.....	.....	.....
Gosfield, S	Yes	Wells	Don't know

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what portion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
None.....			None	No.
1; no; buried or burned; inspection of slaughter houses but not of carcasses.	No	No	None	No.
None; cannot say..	No	No	None	No.
8; no license; no systematic inspection.	No	No	None	No.
1; not licensed, but kept in a good sanitary condition; no systematic inspection.	No	No	No	No.
9; yes; offal is buried or burned; no.	No	No	None	No.
3; no license; fed to hogs.	No	No	None	No.
2; kept in good condition; fed to hogs; no inspection of carcasses.	No system.....	No	None	No.
3; no.....			None	No.
3; isolated.....	No	No	None	No.
.....				
None.....	No	No	None	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Hibbert	No M.H.O. T. Carroll.	Yes, and action taken when complaint is made.	A few cases of tuberculosis.
Huntley	G. H. Groves, M.D.; W. W. Saulter, M.D.; John Argu.	Action is taken when complaint is made.	Scarlatina, 3 cases; diphtheria, 4 cases, 2 deaths; typhoid, 1 case; tuberculosis, 1 case, 1 death.
Humberstone	M. F. Harney, M.D.; A. E. Near.	Inspection is made as required and always in response to complaints.	Scarlatina, 9 cases; diphtheria, 8 cases; typhoid, 12 cases.
Houghton	J. M. Tweedale, M.D.; James Boyd.	No	Diphtheria, 1 case; typhoid, 1 case; tuberculosis, 4 cases.
Hallam	J. F. Jones, M.D.; C. S. Draper.	Yes	Scarlatina, 4 cases, 1 death.
Howick	A. M. Spence, M.D.; Lizzie Walker.	Yes; when complaint is made.	Scarlatina, 3 cases; tuberculosis, 6 cases, 6 deaths.
Howard	A. J. Stevenson, M.D.; George McDonald.	Action taken when complaints are made.	Diphtheria, 7 cases, 3 deaths; tuberculosis, 2 deaths.
Haldimand	James Henderson, M.D.; Thomas Lawless.	General inspection, also action taken when complaint is made.	Scarlatina, 18 cases; diphtheria, 2 cases; typhoid, 4 cases; tuberculosis, 4 cases, 4 deaths.
Huntingdon	E. D. Harrison, M.D.; Hector Wood.	Action taken when complaint is made.	Scarlatina, 1 case; diphtheria, 5 cases.
Hope	A. C. Beatty, M.D.; W. H. McCallum.	Yes, once a year; also action taken when complaint is made.	Typhoid, 6 cases, 1 death; tuberculosis, 5 cases.
Hallowell	A. C. Bowerman, M.D.; Thomas H. Morgan.	Inspection twice a year..	Diphtheria, several cases.
Horton	James Mann, M.D.; Geo. Eady.	No general inspection; action is only taken when complaint is made to board.	Scarlatina, 4 cases, 1 death.
Howich	C. B. Langford, M.D.; G. M. Baird.	Action taken on complaint of nuisance.	Tuberculosis, 5 deaths ..

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
No	No, as far as known to board.	No.....	Yes
.....	Yes; results satisfactory..	Yes	No
Yes; each patient confined to their room; no isolation; hospital.	Yes	Yes	No.....
Yes, to a certain extent...	No	No.....	No; no
Yes	Yes; satisfactory results..	Yes; by M. H. O	No; no
Yes; houses placarded....	No	Yes	No; no
Yes; house placarded; inmates not allowed to mingle with the public.	Yes; all cases recovered when used in time.	Yes	No; no
Yes; separation in private houses; no hospital.	Used in several cases.....	No; under direction of M. D. or M. H. O.	No; no
Patients isolated at well as possible in their own homes.	Yes; satisfactory	Yes	No, no
Yes; houses are placarded.	No; no diphtheria since its adoption by the profession.	Yes	No; no
Yes; quarantine houses...	Yes	Yes; Formaldehyde disinfectant is used.	No; no
Not to any extent; patients are isolated as well as possible.	Yes; results very satisfactory.	Yes	No; no
Yes; house placarded and in case of diphtheria house is quarantined by placing a guard.	Yes; when used early....	After diphtheria, but not in other contagious diseases.	No; no

TOWNSHIPS.—Continued.

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Hibbert	No.....	Wells, 25 feet deep	No.....
Huntley.....	Yes	From well, 25 feet deep.	No ; no tuberculin test.
Humberstone.....	No.....	From drilled wells and springs.	No ; no tuberculosis known to exist in the township.
Houghton	No.....	Wells, 15 to 50 feet deep.	No ; no.....
Hallam	Yes	Wells	No.....
Howick ...	No.....	Wells, average 30 feet...	No : no
Howard	Yes	Wells	No ; no
Haldimand	No.....	Deep wells, average about 20 to 30 feet.	No ; some cases of tuberculosis ; no tuberculin test.
Huntingdon	No.....	Wells and spring ..	No.....
Hope	No.....	Wells	No ; no ; no.....
Hallowell	No.....	Wells, about 12 feet	No ; no
Horton	No.....	Wells	No.....
Howich	Yes	Wells, large* number of artesian from 16 to 120 feet.	No.....

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
None.....	No.....	No.....	None.....	No.
2; no license given; offal is devoured by dogs.	No.....	No.....	None.....	No.
4; the executive officer attends to them; offal buried and disinfected.	Largely so by householder; no cost.	No.....	No, except one hide packer; duly authorized.	No.
None.....	No.....	No.....	None.....	No.
1; no; fed to pigs; no.	Yes; at householder's expense.	No.....	None.....	No.
2; no; fed to hogs.	By householder.....	No.....	None.....	No.
2; no; no.....	.....	.....	.....	No.
4; not licensed; no systematic method; no inspection.	No.....	No.....	None.....	No.
2; no; burned; no.	No.....	No.....	None.....	No.
4; not licensed, but law complied with.	No.....	No.....	.....	No.
5.....	No.....	No.....	No.....	No.
2; not licensed; offal is disposed of by being covered with lime.	No.....	No.....	No.....	No.
5; no license; boiled and fed to hogs.	.....	.....	None.....	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health (Officer and Secretary of Board.	Is there general sanitary in- spection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Hungerford	W. M. Mather, M.D.; Joseph Gabouria.	No; no; yes.....	Diphtheria, 4 or 5 cases, 2 deaths; typhoid, a few cases, 1 death; tu- berculosis, 1 case, 1 death.
Howland	No M. H. O.; Andrew Russell.	No; no; action taken on complaint being made.	Typhoid, 2 cases, 2 deaths.
Holland	No M. H. O.; James P. Hare.	Only on complaint.....	Diphtheria, 2 cases, 1 death; typhoid, 1 case, 1 death; tuberculosis 2 cases, 2 deaths.
Harvey	C. E. Bronnell, M.D.; J. S. Cairnduff.	.....	None
Hawkesbury, E	No M. H. O.; Paul La- brosse.	No; no; action taken only when complaint is made.	Diphtheria, 8 cases, 2 deaths; typhoid, 3 cases, 1 death; tuber- culosis, 15 cases, 6 deaths.
Hawkesbury, W.....	No M. H. O.; F. A. Thistlethwaite.	No	Diphtheria, 1 case, 1 death; tuberculosis, 3 cases, 3 deaths.
Hamilton	No M. H. O.; J. D. Stewart.	Yes	Scarlatina, 9 cases, 1 death; diphtheria, 2 cases; typhoid, 22 cases, 1 death.
Hilton	— Rounthwaite, M.D.; W. E. Whybourn.	Only when complaint is made.	None
Hagarman and Dunchurch ..	C. O'Gorman, M.D.; F. N. Macfie.	Annual inspection on 1st May by sanitary in- spector.	Diphtheria, 15 cases, 1 death; tuberculosis, 3 cases.
Ray	B. Campbell, M.D.; Fred Hess.	School houses, slaughter houses and premises in villages are inspected every year.	Diphtheria, 2 cases, 1 death; typhoid, 18 cases, 1 death; tuber- culosis, 1 case, 1 death.
Hillier	Thorburn & Ruttan, M. D's.; Stephen Nease.	No; no; yes	Tuberculosis, 1 case, 1 death.
Hullett	Thomas Agnew, M.D.; James Campbell.	When complaint of nei- sance is made.	Scarlatina, 1 case, 1 death; typhoid, sev- eral cases.

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the general supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Isolated as well as possible in their houses.	Don't know	No.....	No; no
No	No cases of diphtheria		No.....
Houses placarded and otherwise isolated under care of attending physician.	Don't know	By physicians under direction of a member of the board.	No
Yes, when any occur .....	.....	It is done by the M.H.O.	No.....
No; physicians isolate patients.	Yes; with good results ...	No.....	No; no
No system; houses are placarded and disinfected by attending physician.	Yes; very satisfactory results.	No.....	No; no
When secretary of board is notified by a physician the house is placarded, disinfectants provided and instructions given as to isolation.	Don't know	Yes	No; no
No	M. H. O. says anti-toxine will be used by him if required.	Yes	No
Isolation is carried out as far as possible; no hospital exists.	Yes; M. H. O. reports favorable results.	Yes	No.....
It is left to the medical attendents.	It was used in 2 cases but too late to have any effect on one.	Under direction of M.H. O.	Yes; no.....
No; no	Yes; good results.....	Yes; under supervision of M. H. O.	No; no
No	No	No.....	Yes; no.....

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supplied used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Hungerford	No.....	Wells, 15 to 20 feet	No.....
Howland	No.....		No.....
Holland.....	To physicians only ...	Wells and springs	No.....
Harvey	Yes		No.....
Hawkesbury, E	No.....	Ottawa river, springs and wells, the usual depth from 12 to 20 feet.	No; yes, tuberculosis existed to some extent last spring, some 20 to 25 animals were destroyed by a veterinary surgeon; don't know if tuberculin test was applied.
Hawkesbury, W.....	No.....	Wells, from 20 to 25 feet.	No; no cases of tuberculosis reported; don't know if tuberculin test has been applied.
Hamilton	No.....	Wells, from 12 to 75 feet.	Yes; inspected once during the year; no cases of tuberculosis have occurred.
Hilton	No.....	Springs	No; no cases of tuberculosis.
Hagarman and Dunchurch.....	No.....	Wells and lake water ...	No.....
Hay	Yes	Wells, 20 to 50 feet	
Hillier	No.....	Well, 15 to 25 feet	No; no
Hullett	No.....	Wells, 20 feet	No; no

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what portion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
2; no; offal fed to pigs, generally some burned; no.	No.....	No.....	None, except those of butchers.	No.
None	No towns	No.....	None	No.
None	No.....	No.....	None	No.
None	No.....	No.....	None	No.
5; no license; offal generally boiled.	No.....	No.....	5 slaughter houses ..	No.
4; no; part buried and part decays.	No.....	No.....	None	No.
5; licensed after inspection has been made; no systematic inspection of carcasses.	No.....	No.....	None	No.
None	No.....	No.....	None	No.
None	Each householder is notified to dispose of their own.	No.....	None	No.
3; no license.....	.....	.....	.....	No.
None	No.....	No.....	One manufactory of fish oil.	No.
1; fed on premises; no.	No.....	No.....	None	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Hinchinbrook	No M. H. O.; John Hamilton.	No; no; yes	Diphtheria, 26 cases, 1 death; typhoid, 1 case.
Himsworth, S.	J. A. Porter, M.D.; A. E. Trussler.	No; only when complaint is made.	Scarlatina, 103 cases, 1 death; diphtheria, 5 cases; tuberculosis, 2 cases, 2 deaths.
Himsworth, N.	J. B. Carruthers, M.D.; W. F. Ellis.	Supposed to be	None
Huron	D. A. MacCrimmon, M.D.; Angus Martyn.	.....	Scarlatina, 9 cases; typhoid, 1 case tuberculosis, 3 cases, 3 deaths.
Innisfil	A. T. Little, M.D.; Chas. Palling.	Inspection when complaints are made.	Scarlatina, 2 cases; typhoid, 20 cases.
Joly	No M. H. O.; Thomas Winters.	Only when complaint is made.	None
Jocelyn	No M. H. O.; A. G. Reesor.	No; action taken on complaint.	None
Kingston	No M. H. O.; John Simpson.	Only when complaint is made to Board.	Scarlatina, 2 cases; diphtheria, 3 cases; tuberculosis, 1 case, 1 death.
Kinloss	John S. Tennent, M.D.; Peter Reid.	No; action taken when complaint is made.	Typhoid, 1 case, 1 death; tuberculosis, 2 cases, 2 deaths.
Kennebec	John R. Helm, M.D.; A. Osborne,	Yes; yes	Typhoid, 13 cases, 5 deaths.
Kaladar, A. & E.	No M. H. O.; Moses Lessard.	No; no; yes	Diphtheria, 3 cases, 3 deaths, tuberculosis, 1 case, 1 death.
Kenyon	L. Y. McIntosh, M.D.; A. J. Cameron.	Action only when complaint of nuisance is made.	Scarlatina, 1 death; diphtheria, 1 death; tuberculosis, 3 deaths.
Kincardine	Thomas Bradley, M.D.; R. B. Campbell.	Yes; when complaint is made to the Board.	Typhoid, 2 cases
Keppel .....	.....	Yes	Diphtheria, 4

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; quarantined and a man employed to look after patients; no hospital.	Yes; results were good.....		No; no.....
Yes; no hospital; house with all the inmates quarantined; board of health employs a man to look after the family.	Yes; was not used on patient that died; acted well on the others.	Yes.....	Yes; no.....
No cases.....	No cases.....	Yes.....	Cannot say.....
Yes; separation of patient from inmates; no.	No occasion for it this year	Yes.....	No; no.....
Yes; houses placarded and quarantined.	Yes.....	Yes.....	No; no.....
No occasion.....			No.....
			No.....
No; no hospital.....			No; no.....
	No; the only cases in which anti-toxine was used ended fatally.	Yes.....	No; no.....
No occasion; no.....	No.....	No.....	Yes; no.....
Yes; no hospital.....	Don't know.....	Yes, under supervision of a physician.	No; no.....
No.....	No.....	Yes.....	No.....
Yes no hospital.....	Don't know.....	Only by attending physician.	No.....
Yes, in dwelling.....	Don't know.....	Sometimes.....	No.....

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Hinchinbrook	No.....	Wells and springs.....	No ; no
Himsworth, S.	No.....	Wells, 8 to 40 feet ...	No ; no
Himsworth, N. ....	.....	Water used from springs.	No.....
Huron	No.....	Wells, about 30 feet ...	No ; no
Innisfil	No.....	Wells, about 30 feet.....	No.....
Joly	No.....	Generally springs.....	No.....
Jocelyn	No.....	Wells	No.....
Kingston	No forms used.....	Wells, from 12 to 40 ft.	Inspection twice a year ; no tuberculosis exists.
Kinless	No	Wells	No
Kennebec	No	Springs and wells ; 10 to 15 feet.	No
Kaladar, A. & E	No	Springs	No ; no
Kenyon	No	Wells ; 4 to 40 ft	No ; don't know..
Kincardine	No	Wells ; 20 to 30 ft	No ; no cases
Keppell	Yes .....	.....	No ; no

TOWNSHIPS.—*Continued.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what portion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63 Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
None	No system.	No.	None	No.
2; kept in good condition; offal fed to pigs; no inspection of carcasses.	None, except regular cleaning out of privies.	No.	None	No.
1	No.	No.	None	None.
1; not licensed, but inspected quarterly; buried and burned; no.	No.	No.	Slaughtering of animals.	No.
4	No.	No.	No.	No.
None .....	.....	.....	None	No.
None	No.	No.	None	No.
Five; not licensed; boiled and fed to hogs.	.....	.....	.....	No.
None	No	No	None	No.
One; no; no .....	.....	.....	.....	No.
One; no; not known; no.	No	No	None	No.
None	No	No	None	No.
Four; no license; offal boiled and fed to hogs.	No	No	None	No.
Three	No	No	No	No.

TOWNSHIPS.—Continued.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board.	Contagious diseases.
Keewatin	W. J. Beatty, M.D.; F. J. Cherry.	Yes; yes; once a year, and when complaints are made.	Scarlatina, 6 cases; typhoid, 28 cases, 2 deaths; tuberculosis, 1 case.
Lutterworth.....	C. D. Curry, M.D.; J. H. Hulbig.	When complaint is made.	None
Laurier and Lount.....	No M. H. O.; Rich. Cole.	No	Diphtheria, 1 case
Lobo	P. S. Graham, M.D.; E. R. Barclay.	No; no	Scarlatina, 12 cases; typhoid, 4 cases, tuberculosis, 2 cases, 1 death.
Luther, E.....	A. C. Gaviller, M.D.; J. D. Watson.	No; action taken only upon complaint.	Scarlatina, 2 families; typhoid, 2 cases, 1 death; tuberculosis, 1 case, 1 death.
Louth.....	G. M. Bowman, M.D.; C. Suure.	Yes; and action taken when complaint is made.	Typhoid, 2 cases.....
Limerick	E. N. Wager, M.D.; Jas. W. Ham.	No ..	Tuberculosis, 2 cases, 2 deaths.
London	D. G. McNeil, M. D.; James Grant.	Only when complaint is made.	Diphtheria, 1 death; typhoid, 2 deaths; tuberculosis, 7 deaths.
Lavant	— Kilborn, M.D..... J. M. Browning.	.....	.....
Luther, W	E. Allan, M. D.; Wm. Duncan.	Only when complaint is made.	Scarlatina, 1 death; diphtheria, 1 death.
Laxton, Digby & L.....	James Grant, M. D.; Wm. Maxwell.	When complaint is made.	Diphtheria, 3 cases, 1 death.
Laird	No M. H. O.; T. H. Schoales.	Action taken only when complaint is made to Board.	None
Logan.....	A. Dalton Smith, M.D.; F. Jacob.	Action taken only when complaint of nuisance is made to Board.	Scarlatina, 8 cases, 1 death; tuberculosis, 2 cases, 2 deaths.
Liskeard	No M.H.O.; John Armstrong.	No	None

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes, isolation in private families in separate room,	Had no cases	Yes	No
None	Used in some cases; good results.	Yes	No
No	Don't know	No; Board of Health . .	No
Isolated in a room on top flat.	Have little occasion to use it.	No	No
Yes; house placarded, inmates isolated; no hospital.	No; no occasion to use it.	No	No; no
Not required	Yes	Yes	No; no
No	Don't know	No	No
No; patient removed to hospital; no.	Yes, with good results . . .	No	No
No hospital			No; no
By excluding all but nurse from sick room; no hospital.	Don't know	Yes, by sanitary inspector.	No; no
Yes	Don't know	No	Don't know
No	None in use	No cases	No
		No	No; no

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teacher and M. H. O. of contagious diseases supplied?	Give the source of water supplied used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Keewatin	No	Lake of the Woods and wells ; from 10 to 20 ft.	No
Lutterworth.....	No	Wells	No inspection made
Laurier and Lount.....	No	Wells and springs	No
Lobo	No	Wells ; 20 to 25 ft	No
Luther, E.....	No	Wells ; about 25 ft.....	No ; no
Louth.....	No	Wells ; about 25 to 30 ft.	No ; no
Limerick	Don't know	Wells and springs	No
London	No	Wells and springs; about 40 ft.	Not by any officer of Board ; none reported
Lavant	No	Mostly spring water ...	No ; no ^s
Luther, W	No	Mostly wells ; d o n ' t know	No ; no ; no.....
Laxton, Digby & L.....	No	Wells ; 30 to 50 ft.....	No ; no cases
Laird	No	Surface water and springs	No
Logan.....	No	Wells ; 25 to 60 feet ...	No ; no cases of tuberculosis.
Liskeard	No		

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See S. c. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under the Public Health Act? State in detail the nature of the case, and results of same.
One; in good sanitary condition.	No	No	No	No.
None	None	No	None	No.
None	No	No	None	No.
Two; not licensed.	No	No	None	No.
None	No	No	None	No.
One; yes; buried; no.	Yes	No	None	No.
None	No	No	None	No.
32; yes, fed to hogs.	No	No	One bone boiling establishment.	One for disposing night soil,
None	No	No	None	No.
None	No	No	None	No.
None	Householders remove their own.	No	None	No.
None	No	No	None	One complaint; prosecution as nuisance was removed
None	No	No	None	No.
None	No	No	None	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Lindsay & St. Ed	Wm. Gilroy, M.D.; Thos. German.	Only when complaint is made.	Scarlatina, 1 case, 1 death
Lanark	No M.H.O.; A. Rankin.	Action on complaint or through observation of members of the Board.	Tuberculosis, 1 death. ..
Lochiel	A. L. McDonald, M.D.; V. G. Chisholm.	Action taken when complaint is made.	Diphtheria, 11 cases, 2 deaths; typhoid, 1 case, 1 death; tuberculosis, 10 cases, 10 deaths.
Lac Seud	No M. H. O.; Thos. H. Pritchard.	.....	Tuberculosis, 4 deaths ..
Leeds and Lansdowne, R....	R. J. Gardner, M. D.; D. F. Bracken.	Only when complaint of nuisance is made to Board.	Scarlatina, 25 cases; tuberculosis, 7 cases, 7 deaths.
Leeds and Lansdowne, F....	J. M. Shaw, M.D.; J. D. W. Darling.	Action taken only when complaint is made to Board.	Typhoid, 3 cases; tuberculosis, 10 cases.
Machar	No M.H.O.; Richd. Cole	No	None
Mountain	Geo. Steacy, M.D.; H. Martin.	Action taken on complaint.	Tuberculosis, 2 deaths ..
Monck	S. Bridgeland, M.D.; W. H. Spencer.	Each member of Board acts as inspector.	None
Mayo	No M.H.O.; R. Ramsbottom.	.....	None
Marysburgh, N	J. M. Platt, M.D.; L. Williams.	General inspection at intervals.	Tuberculosis, 2 cases....

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State method adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Houses placarded; persons prohibited from entering or leaving; no hospital.	Cannot say	Yes	No
No	None	No	No
Yes; M.H.O. visits place and placards house.	Yes; as far as can be learned the results are very satisfactory,	In some cases	No; no
No	No	Disinfectants are scarcely ever used.	No; no
Yes	No	Yes	No
Yes; placarding; no	Yes; good results	Yes	No; no
None	Don't know	Usually under the personal supervision of some member of the Board.	No; no
No	Don't know	No	No
No occasion; no hospital..	No diphtheria in tp	Yes	No
As recommended by physicians.	.....	.....	No; except on complaint.
Yes	No	Yes	Yes; no

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supplied used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Lindsay & St. Ed	Have not required them yet.	From wells and springs	No
Lanark	No	Wells	No
Lochiel	No	Wells, streams and springs.	No; no cases reported..
Lac Seud.....	Yes .....	.....	No; no cases have occurred.
Leeds & Lansdowne, R.	No	Wells; from 15 to 50 ft.	No
Leeds & Lansdowne, F.....	No	Wells	No
Machar	Yes	Wells; 10 to 20 ft.....	No
Mountain	No	Wells; 10 to 40 feet	No inspection
Monck .....	.....	Wells; 8 to 20 feet	No cases of tuberculosis have occurred.
Mayo	No	Wells and springs	No
Marysburgh, N	Yes	Wells; 10 ft.....	No; no

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 68, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
None	No	No	None	No.
None	No	No	None	No.
Four; fairly good; buried; no.	No	No	Two tanneries.....	No.
None; no; usually burnt; no.	No	No	None	No.
None	No	No	None	No.
Four; no; buried or fed to hogs; no.	No	No	None	No.
One; offal used as fertilizer.	No	No	None	No.
One; no inspection.	.....	.....	None	No.
One	Each householder removes his own.	No	None	No.
None .....	.....	.....	None	No.
No; no	None	Yes	None	No.

TOWNSHIPS.—Continued.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Minto.....	W. A. Harvey, M. D.; W. D. McKellar.	Action is taken on complaint.	Scarlatina, 6 cases; tuberculosis, 3 cases, 3 deaths.
Mettawan	M. James M. D.; A. Ridout.		
Moulton.....	N. Hopkins, M. D.; Henry Logan.	No; no; only when complaint is made.	Diphtheria, 1 case, 1 death; tuberculosis, 2 cases, 2 deaths.
Marysburgh, S	H. Bredin, M.D.; W. B. Head.	Action taken when complaint is made.	Diphtheria, 1 case.....
Malden	F. J. Parke, M.D.; Jas. Honor.	Action taken only when complaint is made to Board.	Diphtheria, 1 case, 1 death; typhoid, 1 case, 1 death; tuberculosis, 1 case, 1 death.
Medora and Wood.....	No M.H.O.; Henry C. Guy.	General inspection at intervals by members of Board.	None
Maidstone.....	R. F. Rorke, M.D.; M. McHugh.	No; no; action taken only when complaint is made to Board.	Diphtheria, a few cases; typhoid, 4 cases; tuberculosis, 5 deaths.
McKellar	No M.H.O.; G. B. Lee.		Diphtheria, 1 case, 1 death.
Mersea	Chas. Chamberlain, M. D.; Alfred Hairsine.		Scarlatina, 6 cases, 2 deaths; diphtheria, 10 cases, 4 deaths; typhoid, 11 cases; tuberculosis, 4 cases, 4 deaths
Murray	P. J. Clune, M.D.; J. R. Garrett.	Action taken when complaint is made.	Scarlatina, 9; diphtheria, 1 case, 1 death; tuberculosis, 5 deaths.
Mono	— Island, M.D.; Andrew Henry.	No action taken. only when required.	Diphtheria, 6 deaths; tuberculosis, 3 deaths.
Monaghan, N	W. T. Greer, M.D.; G. W. Sennett.	Yes; yes	

TOWNSHIPS.—*Continued,*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; house placarded	No cases	Yes	No; no
.....	.....	.....	No
.....	Yes; results good	No	No; no
Yes; house quarantined: no hospital.	No	Yes	No
Yes	Yes	Under direction of attending physician.	No
Yes; when any cases occur.	No	Yes	Yes; no
Isolation is practised except in the case of tuberculosis.	Cannot say.	Yes	No; no
Yes .....	.....	Yes .....	.....
Isolated at their homes; no hospital.	Not generally used	Not generally	No; no
Yes, as far as possible in private houses; no isolation hospital.	It was used late in one case but death resulted.	Yes	No
No isolation hospital .....	.....	Yes, by the physician in attendance.	No
Yes; isolated in hospital at Peterboro'.	Yes; used frequently; results satisfactory.	Yes, under M.H.O.	No; no

TOWNSHIPS,—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supplied used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Minto.....	No	Wells ; 20 to 30 ft	No ; no
Mattawan.....	No	Spring water	No ; no
Moulton	No	Wells ; from 6 to 16 ft..	No ; no
Marysburg, S	No	Wells, not properly cared for ; 8 to 60 feet.	No ; yes ; 1 case.....
Malden	No	Drilled wells	No
Medora & Wood.....	No	From lakes and wells ...	No ; no.....
Maidstone.....	We keep them usually to supply the schools.	Wells	No ; no ; no.....
McKellar .....	.....	.....	.....
Mersea ..	Yes.....	Wells ; from 20 to 50 ft.	No ; no tuberculosis ; no tuberculin test has been made.
Murray	Yes.....	Wells and springs ; 30 ft.	No ; no ; no test made..
Mono	No	Wells and springs	Don't know
Monaghan, N	No ..	Wells ; 10 to 30 ft.....	No ; no

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what portion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
Four; no; no	No	No	None	No.
None	None	None	None	No.
Two; no license; cooked and fed to hogs; no.			None	No.
Four; no; fed to hogs	No	No	None	No.
One; not licensed but kept in sanitary condition.		No	None	No.
Two; during the summer months buried; no.	All burned or used on land as manure.	No	None	No.
Three, conducted on a small scale.	No	No		o.
			No	
One; not licensed; offal is buried; no inspection of carcasses.	No	No	None	No.
Two; yes; buried; no.	No	No		No.
None	Not done systematically.	No	None	No.
Six; yes; boiled and fed to hogs; no.	No	No	None	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board.	Contagious disease.
Middleton.....	J. W. Renwick, M.D.; John Burnett.	Action taken only when complaint is made.	Tuberculosis, 2 deaths ..
Mikado	No M.H.O.; T. Briderback.	No general sanitary inspection.	None
Matchedash	No M. H. O.; E. W. Kitchen.	Action taken when nuisance is reported.	None
Muskoka	A. P. Cornell, M.D.; R. E. Suttaby.	Only on complaint to any member of the Board.	Tuberculosis, 2 cases. 2 deaths.
Moore	F. R. Seager, M. D.; James Watson.	Action taken when complaint is made	Diphtheria, 1 case, 1 death; tuberculosis, 7 cases, 7 deaths.
Medonte	Jas. Harvie, M.D.; A. W. Heaslip, M.D.; T. D. Robinson.	Action is taken when complaint is made.	Scarlatina, 1 case; diphtheria, 7 cases, 1 death; typhoid, several cases, 1 death; tuberculosis, 4 cases, 4 deaths.
Monmouth	W. Giles, M.D.; J. H. Anderson.	House to house inspection in the month of May, and action taken when complaint is made.	None
Metcalfe	A. Nixon, M.D.; John Hutton.	.....	Scarlatina, 2 cases; tuberculosis, none; typhoid, 2 cases.
March	G. H. Groves, M. D.; Thos. Richardson.	No; action taken when complaint is made.	Typhoid fever, 13 cases..
Mara	Wm. Gilpin, M.D.; W. R. McPhee.	Action taken only when complaint is made to Board.	None
Marmora and Lake	W.G. McKechnie, M.D.; H. M. Jones, M.D.	Action taken when complaints are made.	Scarlatina, 1 case; diphtheria, 2 cases, 1 death; typhoid, 3 cases, 1 death; tuberculosis.

TOWNSHIPS — *Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Houses placarded.....	None used.....	When necessary	No; no
.....	.....	.....	No public schools.....
None reported..	No	No	When called upon; no action taken <i>re</i> vaccination.
Consumptive patients are treated at the Sanatorium.	Not used	Yes	The trustees visit the school occasionally to make general inspection.
Not in all cases	Some times used	Not always	No, not in all cases....
Yes; house placarded	Don't know	Yes	No; no
As well as possible in private houses; no hospital.	No cases of diphtheria in township.	No	No; no.....
No	No	Yes	Yes; no
Yes	Yes, M.H.O. uses it; results are very satisfactory; other physicians use it but have not heard the results.	Yes..	No
.....	Yes	Yes; physicians say it gives favorable results.	Yes
No	Yes; results good	No	No

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teacher and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred? and state whether the tuberculin test has been used.
Middleton	No	Spring creeks and wells; from 10 to 50 ft.	No
Mikado .....	.....	Water from bay .....	.....
Matchedash	Yes, when required	Wells from 12 to 16 feet.	No; no
Muskoka	No	Wells	No
Moore	Yes	Well 12 to 20 feet	No; no
Medonte	Yes	Wells, generally.....	No; no
Monmouth	No	Springs and wells; wells are from 6 to 16 feet deep.	No; no
Metcalfe	No	Wells	No; no
March	Yes	Wells; average about 15 feet.	Inspection has been carried out, but not systematically; tuberculin test has been used in some herds.
Mara	No; no	Water is got mostly from wells from 10 to 90 feet deep.	No; no
Marmora and Lake	No	Wells about 25 feet	No

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under the Public Health Act? State in detail the nature of the case, and results of same.
One; licensed; fed to hogs.	No	No	None	No.
None	Yes, removed regularly by and at cost of Mikado Gold Mining Co.	.....	None	No.
None	No	No	None	No.
One; not licensed; offal fed to hogs; no inspection of carcasses.	No	No	None	No.
None	Owners are expected to keep their premises in a sanitary condition.	Yes; in villages	None	No.
Five; no; offal fed to hogs; no.	No	No	None	No.
None	Each householder looks after his own	No	None	No.
None	From school houses; average cost \$4.00.	None	None	No.
None	No	No	None	One physician was brought before a magistrate for not reporting a case of diphtheria.
No	No	No	None	No.
None	No; only by householders.	No	None	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Macaulay	S. Bridgland, M. D.; Wm. Gohn.	No; when complaints are made.	Typhoid, 1 case
McKim	R. B. Struthers, M.D.; Thos. Stoddart.	Action taken when complaint is made.	Diphtheria, 15 cases typhoid, 5 cases; tuberculosis, 1 case, 1 death.
McNab	S. W. Ward, M.D.; J. D. McNab.	Yes, in June of every year, and repeated when complaint is made.	Scarlatina, 45 cases; tuberculosis, 4 cases, 4 deaths.
McLean and R	No M. H. O.; W. H. Brown.	Yes	None
u r.....	R. L. Ireland, M. D.; Geo. Laking.	Upon complaint	Scarlatina, 3 cases reported; diphtheria, 12 reported, 3 deaths; typhoid, 2 cases; tuberculosis, 3 cases, 8 deaths.
Minden	C. D. Curry, M.D.; S. F. Stinson.	.....	Scarlatina, about 15 cases, 1 death.
Mariposa	G. W. Hall, M.D.; J. B. Weldon.	One thorough inspection every year and at intervals.	Scarlatina, 5 cases; diphtheria, 27 cases, 2 deaths; typhoid, 15 cases; tuberculosis, 1 case, 1 death.
Maryborough	J. J. Cassidy, M.D.; Ed. Dynes	General inspection	Typhoid in one family; 1 death in another family from same cause.
Melancthon	Samuel Moore, M. D.; James Brown.	A general inspection is made.	Diphtheria, 5 cases, 1 death; typhoid 1 case; tuberculosis, 3 cases, 3 deaths.
Manvers	W. W. Nasmith, M.D.; J. J. Preston.	No; action taken when complaint is made.	Diphtheria, 3 cases.....

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes, when required	No cases occurred in the township.	It has always been done.	No ; no
No isolation hospital ; practical isolation obtained in contagious cases.	Yes ; results very satisfactory.	Yes	No ; no
Yes ; patients isolated.....	Don't know	Ye	No
Yes, when occasion requires ; no.	No cases	Yes	Yes, as to inspection
Yes ; disinfection and complete isolation ; no hospital.	So far as heard from fairly successful.	Yes	No ; no
Yes	Yes	Yes	Yes
Placarding is thoroughly done; patients and nurses are isolated.	Yes ; it is very satisfactory.	Partially	Yes ; no
Yes .....	.....	Yes	Yes
Yes ; patients and inmates isolated ; no isolation hospital.	Yes ; good results	Yes	Only when complaint is made
Yes ; houses isolated and placarded ; no hospital.	No	Yes, under supervision of M.H.O.	No ; no

TOWNSHIPS.—Continued.

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Macaulay	No	Wells of various depths..	No
McKim	No	Wells	No
McNab ..	No	Wells from 4 to 50 feet..	In some localities, but not general.
McLean and R.	No	Wells 20 feet deep	No
Mulmur ..	Not yet, but intend to ..	Wells : cannot say	No ; no ..
Minden	No	Springs	No ; no ..
Mariposa	Yes	Wells ; about 20 feet....	No ; no ; no.....
Maryborough		Wells	
Melancthon	Yes ; no	Wells ; 30 to 50 feet	No ; no ..
Manvers	No	Wells and springs ; 10 to 100 feet.	No ; no ..

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
One; no license, but under supervision of Board.	No	No	None	No.
Three; not licensed; inspected by M.H. O. only.	No	No	None	One for not reporting diphtheria case; nominal fine imposed.
Three; not licensed; offal buried.	No	No	None	No.
One; not licensed ..	No	No	No	No.
Three; no; cannot say; when complaint is made; inspection made by the Board.	No	No	None	No.
One	No	No	None	No.
Two; no	No	No	None	No.
One	No	No	None	No.
Three; not licensed; offal destroyed on premises; no inspection.	None	No	None	No.
Two; not licensed; no.	No	No	None	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board.	Contagious Diseases.
Mornington	— Johnston, M.D.; John Watson.	Yes, as required; general only when complaints are made.	Scarlatina, 12 cases; diphtheria, 3 cases; tuberculosis, 1 case.
Monaghan, S.	— Montgomery, M. D.; A. Maycock.	No; action taken only when complaint is made.	Tuberculosis, 3 cases, 3 deaths.
McMurrich	— Barber, M.D.; D. C. McFarlane.	Action taken when complaints are made to Board.	None
McKillop	No M. H. O.; John C. Morrison.	No general inspection...	Tuberculosis, 1 death ...
Nottawasaga	L. McAllister, M. D., also Sec'y.	.....	Diphtheria, 4 cases; tuberculosis, 4 cases, 4 deaths.
Nissouri, East.....	R. E. Towle, M.D.; W. E. Anderson.	Action taken only when complaint is made.	Scarlet fever, 10 cases; diphtheria 2 cases; typhoid, 4 cases; tuberculosis, 2 cases, 2 deaths.
Nichol.	— Paget, M.D.; John R. Wissler.	When complaints are made.	Tuberculosis, 1 case.
Nipissing	J. A. Porter, M.D.; Wm. Maltby.	.....	Diphtheria, 1 case.
Norwich, North	W. R. Watson, M.D.; Chas. E. Burgess.	.....	Tuberculosis, 1 case, 1 death.
Niagara.	R. J. Timble, M.D.; C. Fisher.	Only on complaint.	Tuberculosis, 3 cases, 3 deaths.
Nipigon (unorganized)	No M. H. O.; James Cowie.	No.	None.
Nissouri, West	F. W. Hughes, M.D.; Wm. Lee.	General inspection repeated three times during the summer months.	Scarlatina, 4 cases, 1 death; diphtheria, 1 case; tuberculosis, 4 cases, 4 deaths.

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any Isolation Hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	In disinfection after contagious diseases carried out under the personal supervision of an officer of the Board.	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year.
Yes; as well as possible ..	It has been used, but not in general use; results considered good.	Not always	Only as occasion requires.
No isolation hospital, but patients isolated in their homes.	Used when necessary.....	Yes	No; no
.....	No occasion to use it.....	No disease of this kind to disinfect.	Yes
No occasion	Don't know	No contagious diseases..	No; trustees are notified to clean school yards and closets every May.
Yes; infected houses placarded and families confined to their residences for a certain period; no hospital.	Anti-toxine is used but cannot say anything as to the results.	Yes	No
Yes; by isolating the patients, placarding houses.	No	Under supervision of M. H. O.	No; no
Yes; sent to Guelph hospital.	No	Yes.	No
Yes; isolated in their homes.	No	Yes; by sanitary inspector.	No
Yes; houses placarded and isolation of patients strictly carried out.	.....	Yes; under direction of M. H. O.	Yes; no
No; no hospital.	No	No	No
No.	Yes	No Board of Health	No
Yes; no isolation hospital..	Don't know	Yes.	No; no.....

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms of notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Mornington	Yes	Generally from wells ; 40 ft.	No ; have not heard of any this year.
Monaghan, S	No	Wells ; 25 to 75 feet . . .	No ; no
McMurrich	No	Wells ; from 10 to 20 ft.	No ; no
McKillop . . . . .	. . . . .	Wells ; 20 feet	No, unless complaint made.
Nottawasaga	No	From wells, usual depth from 20 to 50 feet.	No
Nissouri, East	Yes	From wells, 15 to 40 feet.	No inspection ; has not been used.
Nichol	Yes	Wells, from 6 to 40 feet .	No ; no ; yes some tests have been made ; no tuberculosis found.
Nipissing	No	Wells, 12 to 18 feet . . .	No
Norwich, North	Yes	Wells, 30 feet	No ; no
Niagara	No	Wells, average about 20 feet.	None
Nipigon (unorganized) . . . . .	. . . . .	From creek and Nipigon river.	No
Nissouri, West	Yes ; to M.H.O.	From wells, about 30 feet.	No ; none

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what portion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated.	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, and results of same.
Two; no, but kept in good sanitary condition: offal burned; not systematic.	No	No	None	No
None	No	No	None	No
None	No	No	None	No
No license	No	No	None	No
None				None
Two; not licensed: no.			One tannery not licensed.	None.
One; no; no; offal generally fed to hogs; no.		No	Slaughter house	No; only 2 cases; nuisance removed.
None	No system	No	None	No.
Three; no.	No	No	None	No.
One; unlicensed; no inspection of carcasses.	No	No	None	No.
None	Each householder removes their own.	No	None	No.
Three; yes; licensed; offal boiled and fed to hogs on premises.	No	No	None	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Normandy.	P. McLean, M.D.; Geo. Hopf.	Partial, no; action taken when complaints are made.	Typhoid, 5 cases; tuberculosis, 1 case, 1 death.
Nairn, Lorne and Hyman...	G. F. Jones, M.D.; H. L. McLean.	.....	Consumption, 1 case, 1 death.
Nepean	J. W. Shillington, M.D.; F. W. Harmer.	.....	Scarlatina, 11 cases; Diphtheria, 16 cases, 2 deaths.
Orford North	L. M. Williams, M.D.; Richard Seldan.	Yes; yes	Scarlatina, 1 case
Orford	P. M. Davey, M.D.; Henry Watson.	When complaints are made action is taken.	Tuberculosis, 9 cases....
Oneida	W. E. Olmsted, M.D.; John Senn.	Action taken only when complaint is made.	Typhoid, 5 cases, 1 death
Osnabrock.	D. Jamieson, M.D.; H. E. Hodgins.	No; no; action taken only on complaint.	Tuberculosis, 3 cases, 3 deaths.
Onondaga.	J. Ogden, M.D.; S. J. McKelvey.	Action is only taken when complaint of nuisance is made to Board.	Scarlatina, 3 cases; tuberculosis, 1 case, 1 death.
Oxford, East.	J. McLurg, M.D.; J. Peers.	Action taken only when complaint is made.	Scarlatina, 15 cases; diphtheria, 1 case; typhoid, 2 cases.
Oxford	J. A. James, M.D.; Wm. Lindsay.	No; action taken only when complaint is made.	Diphtheria, 4 cases, 1 death; typhoid, 1 case; Tuberculosis, 2 cases, 2 deaths.
Oro	W. H. Clutton, M.D.; H. J. Tudhope.	Only when complaint is made to Board.	Scarlatina, 4 cases, 1 death, diphtheria, 6 cases, 2 deaths; typhoid, 13 cases.

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Fairly well; placard houses; no isolation hospital.	Yes; results good especially as a preventive.	Yes.	No
No contagious diseases. ...	No .....	.....	Yes.
Yes; houses placarded, visitors prohibited, attending school and public meetings not allowed, patients are placed in upper rooms of the house.	Only by part of the profession, results most satisfactory where used.	No; it is done according to instructions given by M.H.O., viz: fumigation with sulphur, and steam boiling all clothing with disinfectants, carbolic acid, bichloride of mercury, etc., washing woodwork and walls, whitewashing or removing paper and re-papering.	No; no
By placard only .....	.....	.....	Yes; no
Always quarantined when cases occur.	Yes; favourable results. ...	Yes.	No; no
Isolation ordered, outsiders not allowed to visit houses placarded.	Do not know	Yes.	No; no
Houses placarded and mingling with the public forbidden.	Not in use	Yes.	No
Not necessary, no hospital.	No	No	No; no
Yes	No	No	Yes; no
No; no isolation hospital.	Don't know	No	No; no
When possible; no hospital.	Yes; where membrane has developed no benefit was observed, where used very early the cases proved mild.	Yes; when Board is notified.	No; no

TOWNSHIPS.—*Continued*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supplied used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Normandy.	Yes.	Wells, 15 to 30 feet.	No.
Nairn, Lorne and Hyman.	No.	Springs.	No.
Nepean.	No.	Wells, varying from 8 to 25 feet deep. ....	.....
Orford, North.	No.	Wells, 20 feet.	No ; none.
Orford.	No.	Wells, varies according to location and soil.	No.
Oneida.	Not for teacher. ....	.....	No dairy.
Osnabruck.	No.	Wells, 16 to 40 feet, and St. Lawrence river.	No.
Onondaga.	No.	Wells.	No.
Oxford, East.	Yes.	Wells.	No.
Oxford.	No.	Wells, about 20 feet.	No ; no ; no.
Oro.	No.	Wells, from 10 to 150 feet.	No.

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
Three; yes; cooked and fed to hogs; no.	No	No	None	No.
None	No	No	None	No.
.....	.....	No .....	.....	No.
Two; yes; boiled; no.	No	No .....	.....	No.
None	Yes.	No	None	No.
None	No	None	None	No.
None	No	None	No	No.
One; not licensed; offal used as fertilizer; no systematic inspection of carcasses.	No	No	None	No.
Four; no; no	No	No	None	No.
None; no	No	No	None	No.
Two; no; carted some distance from dwelling and fed to hogs; no.	No	No .....	.....	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Orillia.	G. H. Corbett, M.D.; John C. Rose.	Action is only taken upon complaint.	Diphtheria, 1 case; typhoid, 4 cases, 2 deaths, Tuberculosis, 3 cases, 3 deaths.
Otonabee	J. M. Shaw, M.D.; J. M. Drummond.	Partial inspection and action taken when complaint is made.	Scarlatina, 2 cases; diphtheria, 1 case; tuberculosis, 1 case, 1 death.
Oakland.....	Thos. H. Mott, M.D.; Henry Key.	Only on complaint.	None
Oakley	S. Bridgeland, M. D.; Edward Elliott.	Only on complaint.....	None
Ops.	Thos. W. Pool, M.D.; W. F. O'Boyle.	Yes; as far as expediency requires cheese factories and slaughter houses regularly, public schools and other premises occasionally.	Typhoid, 2 cases, 1 death; Tuberculosis, 3 cases, 3 deaths.
Oso.	No M. H. O.; S. C. Bourk.	No; only when complaint is made.	Scarlatina, 10 cases, 1 death; tuberculosis, 2 cases.
Pittsburg	None; Chas. Belwa.....	None	Typhoid, 1 case, 1 death; tuberculosis, 2 cases, 2 deaths.
Proton	R. M. Mitchell, M.D.; Thos. Laughlin.	Action only taken when complaint is made to Board.	Tuberculosis, 3 cases, 3 deaths.
Pilkington ..	— Robertson, M.D.; G. F. Cromar.	Yes; repeated twice every year.	Scarlatina, 3 cases, 1 death.
Peel.	John D. McNaughton, M.D.; James Wallace, M.D.; Magnus Henderson.	When complaint is made.	None reported....

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
The house is placarded and an officer placed in charge to attend to the wants of the family, and to prevent any inmates from mingling with the public.	Yes.	Yes	The township is divided into districts, and a member of the Board inspects the schools in his district; no.
Placarding houses	No	Yes.	No; no
No; no .....	.....	No	No; no
No provision	Don't know	Yes.	No
Yes; as far as can be done at their homes; no isolation hospital.	Yes; results have been good.	Yes.	No
Fairly well; no isolation hospital.	No cases this year	No; physician in charge attends to this.	No
Yes; patients removed to hospital in Kingston.	Don't know	Don't know; physician in attendance order disinfection to be carried out.	Don't know.....
No; no hospital.....	Don't think it is	No.....	No; no.....
Yes; houses placarded; no isolation hospital.	Used when diphtheria exists; good results.	Yes.....	Yes; no.....
As far as possible in their own homes.	Yes; cannot say to what extent.	Yes; by M. H. O. and sanitary inspection.	No; no.....

TOWNSHIPS.—Continued.

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum?	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Orillia	No	Spring wells, 12 to 40 feet.	No; none
Otonabee	No	Wells, 25 feet	No; no
Oakland	Yes.	Wells	No; no
Oakley	To M. H. O. only		None
Ops	Yes; but happily they are seldom used.	Wells, varying from 10 to 50 feet in depth, good quality, with hard pan gravel, rock 'bottom.	Not of dairy cows in particular, members of Board and local veterinary are on the alert for lump-jaw and tuberculosis, and are summarily dealt with, 3 cases of lump-jaw were reported to our veterinary, but upon examination they proved to be from other causes than actinimycosis.
Oso	No	Springs	No; no
Pittsburg	No	Wells	No; no
Proton	Yes	Wells; 20 feet deep	No
Pilkington	No	Wells; about 25 feet	No: no
Peel	No	Wells	No inspection; a few cases occurred; test made and cattle destroyed.

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what portion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, and results of same.
Three; not licensed; used for feeding purposes; bones dried and sold	No	No .....	.....	None.
Three; not licensed; but inspected and kept in good condition.	No	No	None	No.
Two; no license; usually fed to hogs; no.	No	No	None	No.
None	None	No	None	No.
Four; yes; boiled or strained and fed to hogs; no regular inspection of carcasses; no complaint made of meats offered for sale.	No; garbage as a rule is added to manure pile; night-soil if not absorbed in dry earth closets or used as manure is buried.	No	None	No.
None	No	No	None	No.
None.....	Don't know.....	Not required	None.....	No.
None.....	No	No	None.....	No.
None.....	Deposited on land ..	No	None.....	No.
None.....	No system.....	No	None.....	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board.	Contagious diseases.
Petewawa	A. T. Irwin, M.D.; Geo. Guertin.	Only when complaint is made.	Diphtheria, 1 case, 1 death.
Percy	J. M. Clemmison, M.D.; R. P. Hurlbert.	Action taken by Board when complaints are made.	Scarlatina, 2 cases; diphtheria, 8 cases, 1 death.
Perry	—, Barber, M.D.; E. B. Clearwater.	Inspection in May	None
Plympton	P. McG. Brown, M.D.; J. K. Cairns.	Action taken only when complaint is made.	Scarlatina, 10 cases, 1 death; diphtheria, 1 case.
Pelham	Wm. M. Comfort, M.D., J. C. Crow.	Only when complaint is made.	Scarlatina, 2 cases; tuberculosis, 2 deaths.
Papineau	—, James, M.D.; R. Ranson.	Only when complaints are made.	None.
Puslinch	No. M. H. O.; James McLean.	General sanitary inspection every spring and fall.	Scarlatina, 4 cases; diphtheria, 2 cases.
Palmerston, etc.	John Elkington, M.D.; Isaac Allan.	Only when complaint is made.	Typhoid, 1 case, 1 death; tuberculosis, 1 case, 1 death.
Pelee	No. M. H. O.; John McLellan.	Only when complaints are made.	.....
Pickering	No. M. H. O.; D. R. Beaton.	General inspection in villages, in other parts of municipality upon complaint.	Diphtheria, 1 case; tuberculosis, 7 deaths.
Plantagenet, N.	N. Gaboury, M.D.; J. Belanger.	Yes; once or twice annually.	Scarlatina, 6 cases, 1 death; diphtheria, 5 cases, 2 deaths; tuberculosis, over 20 cases, 3 deaths.

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Not as well as it should be.	Cannot say .....	.....	Don't know.
Yes; patients and inmates are kept in the house where disease exists.	Have treated 3 cases of diphtheria with anti-toxine, with good results (J. M. C.)	Yes	No; no
.....	Yes .....	.....	No
Yes; when cases are reported houses are placarded and patients isolated from the rest of the family; no hospital.	Yes; results are favorable.	Yes	No; no
Yes; no hospitals; usually by warning the public by means of placard on premises.	Can't say	Yes, when necessary....	No
No	No	Yes	No
Yes; house placarded	No.	Yes	Systematic inspection carried out.
No; none; no .....	.....	.....	No
.....	.....	.....	No; no
Yes; no hospital	No	Yes	Yes, annual inspection made; no.
Yes; kept isolated; no hospital.	When necessary; good....	Yes	No; no

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teacher and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Petewawa .....	.....	Spring and well water ..	No
Percy	Yes	From clay stratum; 25 to 50 feet deep.	No; none
Perry	No .....	.....	No; none
Plympton	M. H. O. supplied only .	Surface wells	No; no cases of tuberculosis.
Pelham	No .....	.....	No; no tuberculosis
Papineau	No	Streams	No
Puslinch	No	Wells and springs	No; no
Palmerston, etc	No	Wells and springs; usual depth 6 to 30 feet.	No; no
Pelee	No	Lake and artesian wells .	No
Pickering	Yes	Wells; good water, from 20 to 60 feet.	No; no
Plantagenet, N	Yes	Wells and springs	No

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under the Public Health Act? State in detail the nature of the case, and results of same.
None.....	On school premises only.	No		No.
One; offal is fed to hogs; no.	No	No	None.....	No.
One; sanitary condition fairly good.		No	None.....	No.
Two; not licensed; fed to hogs and buried; no inspection.	No	No	None.....	No.
Three ..	No; not necessary..	No	One tannery, buying hides; two or three butchers, slaughtering animals.	No.
Two; not licensed; offal fed to pigs; no.	No	No	None.....	No.
Two; not licensed ..		No	None.....	No.
None..		No	None.....	No.
None.....		No	None.....	No.
Fourteen; yes; burned; no.	No	No	None.....	No.
Five; no; burned; no.	No	No	None.....	No.

TOWNSHIPS — *Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board.	Contagious diseases.
Pembroke	J. D. Deacon, M.D.; H. W. Perrett.	No	None.....
Ryde	S. Bridgeland, M.D.; W. Tingey.	Action is taken when complaint is made to Board.	None.....
Rainham	John Fry, M.D.; R. A. Havill.	Only when complaint is made	None.....
Rayside	No M. H. O.; Z. Regimbal.	No	None.....
Radcliffe and Raglan.....	J. E. A. Miller .....	.....	Diphtheria, 6 cases, 2 deaths.
Rolph, Buchanan and Wylie.	W. L. Gray, M.D.; F. McCarthy.	No; action taken only on complaint.	None.....
Ryerson	— Crawford, M.D.; E. Geddes.	No general sanitary inspection; action is only taken on complaint.	None.....
Rochester	R. F. Rorke, M.D.; S. Ducharme.	When complaints are made to the Board.	Scarlatina, a few cases; typhoid, 1 case; tuberculosis, 3 cases, 3 deaths.
Raleigh	S. N. Young, M.D.; H. E. Robinson.	Action taken when complaint is made.	Scarlatina, 30 cases, 1 death; diphtheria, 2 cases.
Ross	A. W. Mair, M.D.; Wm. Grant.	Yes; no; yes	Scarlatina, 7 cases, 1 death, diphtheria, 14 cases, 1 death; typhoid, 1 case.
Rawdon	W. A. Sargent, M.D.; Thomas McConnell.	The township is divided into four parts, under especial care of a member of the Board; chairman and M.H.O. have special supervision	Typhoid, 1 case; tuberculosis, 6 cases.

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
No occasion	Yes; good results	No.....	No
Yes; no hospital .....	.....	Yes.....	No; no.....
No.....	Cannot say.....	No	No
.....	.....	.....	No
No.....	.....	Yes.....	No
.....	.....	.....	No
No cases this year	Not required this year	Yes, if necessary.....	No; no.....
Houses placarded	Yes; results satisfactory..	Yes.....	No
Yes; house placarded.....	Yes; don't know	Not usually	No; no.....
Yes; houses placarded, patients isolated as far as possible from the other members of the family; anti-septic precautions taken; no isolation hospital.	Yes; results have been very satisfactory.	No; directions are given by attending physicians.	No; no.....
Yes.....	Don't think it is used	Yes.....	No; no.....

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teacher and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Pembroke	Yes	Ordinary wells.....	No
Ryde	No	Wells	No; no.....
Rainham	No	Wells; from 10 to 25 feet	No
Rayside	No .....	.....	No
Radcliffe and Raglan	No .....	.....	No
Rolph, Buchanan and Wylie.	No .....	.....	No; no.....
Ryerson	No	From natural springs ..	No; no.....
Rochester	No	Wells; from 12 to 18 feet	No
Raleigh	No	Wells; from 10 to 100 feet deep.	No; no tuberculosis reported.
Ross .....	.....	Wells; 20 feet.....	No; don't know
Rawdon	No	Springs and wells.....	No

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what portion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under the Public Health Act? State in detail the nature of the case and results of same.
Three; no.....	No	No	Slaughter houses....	No.
None.....	.....	No	None.....	No.
None licensed.....	No	No	None.....	No.
None.....	No	No	None.....	No.
None. ....	.....	.....	None.....	No.
None.....	No	None.....	None.....	No.
None.....	No	No	None.....	No.
Two .....	.....	.....	.....	No.
One; no; burned; no.	No	No	None.....	No.
One; no; don't know.	No	No	None.....	No.
Three, kept in good condition; no licenses; cooked and fed to pigs; no.	No	No	None.....	No.

TOWNSHIPS.—Continued.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Rama	W. C. Gilchrist, M.D.; John Waldron.	Only when complaint is made to Board.	.....
Reach.....	John Park, M.D.; Wm. Spence.	Yes; special action taken when complaint is made.	Scarlatina, 2 cases; tuberculosis, 8 deaths.
Romney.....	W. H. Miller, M.D.; J. W. Hodgson.	General sanitary inspection.	None reported.....
Russell.....	F. M. Perris, M.D.; W. R. Craig.	Action taken when complaint is made.	None reported.....
Strong	— Carmichael, M.D.; John Carter.	Only when complaint is made.	Typhoid, 5 cases.....
Sherbrooke	N. Hopkins, M.D.; Geo. Chalmers.	No; no; yes.....	Diphtheria, 8 cases; typhoid, 2 cases; tuberculosis, 1 case, 1 death.
Sunnidale	Geo. Hunt, M.D.; T. F. Burrows.	.....	Tuberculosis, 1 case, 1 death.
Saugeen.....	Geo. Veitch, M.D.; R. B. Fleming.	Cheese factories and slaughter houses are inspected.	Scarlatina, 4 cases, 1 death; typhoid, 6 cases, 1 death; tuberculosis, 7 cases, 3 deaths.
Sandwich, E.....	D. Beachard, M.D.; Maurice Renaud.	.....	Diphtheria, 4 cases.....
Seneca	No M.H.O.; A. Williamson.	Yes; one general inspection, after which action is taken when complaint is made.	Typhoid, 3 cases, 1 death.
Stephenson	S. Bridgland, M.D.; Daniel Bain.	.....	Diphtheria, 1 case; typhoid, 2 cases; tuberculosis, 1 case, 1 death.
Sombra	D. K. Stinson, M.D.; Orro Bishop.	Action taken only when complaint of nuisance is made.	Scarlatina, 4 cases; diphtheria, 50 cases, 5 deaths; typhoid, 12 cases, 1 death.
Stanley	M. N. V. Armstrong, M.D.; J. T. Cairns.	No.....	Scarlatina, 10 cases; typhoid, 3 cases; tuberculosis, 2 cases, 2 deaths

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all case where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Not required this year	Not used this year	Yes	No
Placarded promptly when reported.	Yes; favorable results have followed every case.	Yes; under supervision of M. H. O. or some member of the Board.	Yes; no.....
Yes, when any cases occur.	.....	Yes	No
Placard house; no hospital	Yes; in every case successful.	Yes	No
Yes; no hospital	No.	Yes	No.....
Yes; no.....	Yes; good results.....	No.....	No.....
Yes; by complete isolation.	Yes, when required; good results.	Yes	No.....
Isolation carried out under instructions of attending physician.	No cases.....	No; some cases by M. H. O.	No; no.....
House quarantined.....	No.....	Yes.	No; no.....
Yes; house placarded; no hospital.	No cases reported this year.	Yes; no.....	No.....
Yes; no hospital exists....	.....	No.....	No.....
Yes; as far as possible in private houses; patients are confined to single apartment and door of apartment protected by a sheet saturated with corrosive solution.	Yes; it proves universally helpful when used early.	Yes.....	No; no.....
No.....	.....	No.....	No; no.....

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Rama	Yes .....	.....	No ; no ; no.....
Reach	Supplied to physicians ..	Wells ; from 20 to 45 feet	No
Romney.....	Yes.....	Wells ; 12 feet deep.....	No ; no.....
Russell.....	Yes.....	Wells ; about 20 feet....	No
Strong	No.....	Wells, about 10 to 20 ft..	No.....
Sherbrooke	Yes	Wells	No ; no.....
Sunnidale	Yes	Wells, 15 to 30 ft.....	.....
Saugeen	Supplied by the secretary of Board when asked for.	Wells, and Saugeen River	No ; no cases reported in 1898.
Sandwich, E.....	No.....	Wells, from 10 to 18 ft ..	No ; no ; not used.....
Seneca .....	.....	Wells and springs.	No dairies ; no inspection ; no cases.
Stephenson	No.....	Wells and springs.....	No ; no
Sombra.....	No.....	Cistern water largely used, but in some parts wells are mostly used.	No ; no
Stanley.....	No.....	Wells, 15 to 20 ft.....	No ; no

TOWNSHIPS—*Continued.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is official disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what portion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
One; not licensed ..	None; removed	No	None.....	No.
Four; not licensed, but are kept in sanitary condition.	No	No	None... ..	No.
Two; no	No	One being constructed.	None.....	No.
Three; no; no	No	No	None.....	No.
None.....	No.....	No.....	None.....	No.
None.....	No.....	No.....	None.....	No.
1.....	None.....	No.....	None.....	No.
1 near Pt. Elgin and 5 in township; licensed.	No; removed by householder.	No.....	None.....	No.
5; yes; buried and fed to hogs; only on complaint.	No.....	No; drained by ditches.	None.....	No.
None.....	Removed by householder.	No.....	None.....	No.
1; no.....	No.....	No.....	None.. ..	No.
2; no license; don't know.	No.....	No.....	None.....	No.
None.	No.....	No.....	None.....	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Sandwich, S.....	— Cruikshank, M.D.; John Monaghan.	No; no; only on complaint.	Diphtheria, 6 cases; tuberculosis, 1 case, 1 death.
St. Vincent	F. H. Heming, M.D.; G. G. Albray.	No regular system of inspection by sanitary officer, but any cases reported receive prompt attention.	Scarlatina, 5 cases; typhoid, 2 cases.
Storrington.....	No M. H. O.; Alex. Ritchie.	.....	.....
Sherborne, etc.....	No M. H. O.; J. B. Shrigley.	No.....	None.....
Stafford.....	Geo. E. Josephs, M.D.; Jno. Kidd.	Only when complaint is made.	Diphtheria, 6 cases, 1 death; typhoid, 1 case.
Sheffield	C. D. Clarke, M.D.; Jas. Aylsworth.	Action taken only when complaint is made.	Diphtheria, 3 cases 1 death; tuberculosis, 3 cases 3 deaths.
Sarnia,	T. G. Johnston, M.D.; M. Lowrie.	Upon complaint of nuisance.	Scarlatina, 3 cases, 2 deaths; diphtheria, 2 cases, 1 death; tuberculosis, 2 cases, 2 deaths.
Sandfield.....	— Berry, M.D.; W. A. Hare.	No; no complaints made.	None.....
Stisted	No M. H. O.; Thos Lakeman.	.....	None.....
Scugog	No M. H. O.; John Fry.	Only when complaint is made.	None.....
Sydenham.....	A. C. Sloane, M.D.; James Cannon.	Action taken when nuisance is complained of.	Scarlatina, a number of cases; typhoid, 6 cases, 1 death; tuberculosis, 1 death.
Springer	No M. H. O.; O. Lafrance.	No inspection made unless requested.	None.....
Sebastopol	No M. H. O.; C. Walther.	No.....	None.....
Sarawak.....	No M. H. O.; John McKenzie.	Nct this year; only on complaint.	Typhoid, 1 case, 1 death.
Southwold.....	Duncan Smith, M.D.; M Campbell.	By Board of Health.....	Diphtheria, 3 cases, 1 death; tuberculosis, 9 cases, 9 deaths.

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Houses placarded and inmates not allowed to leave the house.	Yes; with good results....	Yes	No; no.....
No.....	No.....	Yes	The public school trustees are notified each year to attend to school premises and place the same in a proper sanitary condition.
.....	.....	No.....	No.....
No occasion to isolate.....	No diphtheria	No.....	No.
No person allowed to enter the house.	Yes; it was not used in the case that ended fatally.	Under supervision of attending physician.	No.....
No hospital; physician in attendance isolate patient in dwelling.	Yes; good results.....	No; no.....	.....
Usual methods employed by physician in attendance.	.....	Attending physician looks after disinfection.	No.
.....	No.....	.....	No.....
.....	No.....	Yes	No.....
No.....	.....	No.....	No.....
Yes; isolated in homes only.	No.....	Yes	No; no.....
No hospital; isolation would be carried out if necessary.	Don't know.....	.....	No inspection; certificate of vaccination has not been required so far.
No.....	No.....	No.....	No.....
Yes; by isolation of house; no hospital.	No.....	Yes	Yes.....
No.....	No.....	Yes.....	Yes.....

TOWNSHIPS.—*Continued*,

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Sandwich, S.....	Yes	Surface wells, from 12 to 16 ft., and artesian wells, from 90 to 110 ft.	No; no
St. Vincent	Yes	Generally wells.....	No; no
Storrington.....	No.....		
Sherborne, etc.....	No		None.....
Stafford			No; no
Sheffield.....	Yes; to physicians....	Wells, drilled in rock 20 ft.	No; no
Sarnia	Yes	Wells	Yes.....
Sandfield		Spring creeks and wells, about 15 ft.	No; no; no.....
Stisted.....	No.....	Wells	No.....
Scugog.....	No.....	Wells, about 30 ft.	No inspection.....
Sydenham	Yes	Wells, from 9 to 30 ft. .	No; no.....
Springer	Not unless requested by teacher or M.H.O.	Wells, generally from 6 to 10 ft.	No... ..
Sebastopol.....	No.....	Springs and wells	No.....
Sarawak.....	Yes.....	Wells, 20 ft. deep.....	Yes; no.....
Southwold.....	No.....	Wells	Yes.....

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what portion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
3; no; offal fed to hogs; no.	No.....	No.....	None.....	No.
1; inspected several times during the year by the sanitary inspector; no inspection of carcasses.	No.....	No.....	None.....	No.
.....	.....	No.....	.....	No.
None.....	.....	.....	None.....	No.
None.....	No.....	No.....	None.....	No.
1; no; don't know..	No.....	No.....	No.....	No.
11; inspected at intervals; don't know; no.	No.....	No.....	Slaughtering of animals.	No.
None.....	None.....	No.....	None.....	No.
None.....	None.....	No.....	None.....	No.
None.....	.....	.....	None.....	No.
None.....	No.....	None.....	None.....	No.
None.....	No.....	No.....	None.....	No.
None.....	No.....	No.....	None.....	No.
1; not licensed; good condition; no inspection of carcasses by Board.	No.....	No.....	One.....	No.
5; no; boiled; no.	No.....	No.....	None.....	No.

TOWNSHIPS.—Continued.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Somerville	R. S. Frost, M.D.; Samuel Suddaby.	.....	None reported.....
Scarboro'	O. Sisley, M.D.; T. Crawford.	Action taken only when complaint is made to Board.	Scarlatina, 8 cases; diphtheria, 4 cases; typhoid, 7 cases; tuberculosis, 4 cases, 1 death.
Sherbrooke, S.	W. Kilborne, M.D.; Henry Rigney.	No; action taken only when complaint is made to Board.	None.....
Stephen	— Rivers, M.D.; C. Prouty.	General inspection.....	Diphtheria, about 20 cases, 3 deaths; typhoid, 3 cases; tuberculosis, 4 cases, 4 deaths
Stanhope.....	No M. H. O.; Wm. Cooper.	No; yes.....	Tuberculosis, 1 case, 1 death.
Sullivan.....	H. G. Pickard, M.D.; A. Stephen.	Action taken when complaint is made to Board.	Diphtheria, 6 cases; tuberculosis, 4 cases, 4 deaths.
Stamford	John M. Dee, M.D.; F. A. Hutt.	Yes; yes; and also when complaints are made to Board.	Scarlatina, 6 cases; tuberculosis, 1 death.
Sophiasburg	John Cryan, M.D.; C. H. Wright.	.....	None.....
Tay.....	No M. H. O.; S. L. Montgomery.	Action taken when attention of Board is called to it.	Tuberculosis, 7 cases ...
Tecumseth'.....	No M. H. O.; Henry Stone.	.....	None
Thessalon.....	No M. H. O.; J. E. Clinton.	No; action taken only when complaint is made to Board.	None
Turnberry	C. A. Toole, M.D.; Jno. Burgess.	Action taken when complaint is made to Board.	Tuberculosis, 1 case, 1 death.

TOWNSHIPS.—*Continued*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Premises placarded, no isolation hospital.	Have not heard of it being used.	Yes; generally under supervision of M.H.O.	No; no.....
Yes; houses placarded and inmates quarantined.	No.....	No.....	Yes; no.....
No; isolation carried out..	No.....	No.....	No; no.....
Not allowed to mingle with the public.	Yes; with favorable results.....	Yes.....	.....
Houses placarded; no isolation hospital.	Don't know.....	Yes.....	No; no.....
Yes; all inmates of house kept from mingling with general public.	No... ..	Yes.....	No; but the trustees have to certify that they have complied with the health by-laws of the township.
No; by placarding only; no isolation hospital.	No; no cases.....	No; not possible in some cases.	No; no.....
.....	No cases.....	When necessary.....	No.....
No; when a case occurs the house is placarded; no isolation hospital.	No.....	Yes.....	No; no.....
None.....	None.....	Yes.....	No.....
No; placard house; patient isolated from other members of family.	No occasion.....	No.....	No; no.....
When ordered by M. H. O. only; no hospital, placard houses and had families isolated as much as possible.	No necessity.....	Yes; under supervision of M.H.O.	No; no... ..

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supplied used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Somerville	Yes.....	Principally wells, from 10 to 30 ft	No ; no dairies.....
Scarboro'.	Yes.....	Wells, 40 ft.....	No ; yes, and tuberculin test used.
Sherbrooke, S.	No.....	Wells, about 15 ft.....	No inspection ; no test..
Stephen . . . . .	.....	Wells	No ; no ; no.....
Stanhope.....	No.....	Wells	No ; no.....
Sullivan	Yes.....	Mostly wells, about 20 ft.	No large dairies.....
Stamford.....	Not to teachers.....	From wells, 25 ft. deep..	No ; yes ; yes
Sophiasburg	No.....	Wells and springs, 20 ft.	No.....
Tay.....	No	Wells ; 25 ft.....	No ; no occasion.....
Tecumseth	Yes	Wells ; 18 to 50 ft	Don't know
Thessalon	No	Wells ; about 14 ft.....	No ; no ; the tuberculin test has never been tried.
Turnberry.....	None have been required	Wells ; 15 to 30 ft	No ; none reported

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
None.....	Each householder attends to his own; Board interferes only when complaint is made.	No.....	None.....	No.
9; yes; fed to pigs; no.	No.....	No.....		No.
None.....	No.....	No.....	None.....	No.
2; not licensed; not sufficient inspection			None.....	No.
None.....	No.....	No.....	None.....	No.
1; yes; no		No.....	One slaughter house; one tannery.	No.
5; kept in a sanitary condition; fed to hogs; no.	No.....	No.....	None.....	No.
1; no.....	No.....	No.....	None.....	No.
Three; no; generally fed to hogs.	No.....	None.....	None.....	No.
One; cannot say....	No.....	No.....	None.....	No.
One; no; fed to hogs.	No.....	No.....	None.....	No.
Only 3; not licensed; don't know how offal is disposed of; no systematic inspection.	No.....	No.....	None.....	No.

TOWNSHIPS.—Continued.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Tossorontio	J. J. Williams, M.D.; Thomas Irwin.	Action taken when complaint is made to Board	None
Townsend	A. Bowlby, M.D.; S. Cunningham.	No	Scarlatina, 1 case, 1 death; diphtheria, 2 cases, 1 death; tuberculosis, 1 case, 1 death.
Tyendinaga	H. O. Lanfear, M.D.; A. R. Randall.	No; no; only when complaint is made to the Board.	Tuberculosis, 1 case, 1 death.
Tiny	Geo. Bowman, M. D.; W. H. Clute.	No; only on complaint.	.....
Tilbury, N	J. A. Lemire, M.D; J. A. Tremblay.	Action only when complaint is made.	Diphtheria, 3 cases; tuberculosis, 2.
Tuckersmith.....	No M. H. O.; A. G. Smillie.	Action taken only when complaint is made to Board.	Scarlatina, 3 cases, 1 death; tuberculosis, 1 case, 1 death.
Thurlow	D. W. Faulkner, M D.; Anson Lotta	No; no; action only taken when complaint is made.	Scarlatina, 1 case, 1 death; Tuberculosis, 4 cases, 4 deaths.
Tilbury, E.....	C. B. Oliver, M.D.; D. A. Farquharson.	Action taken upon complaint or report of any member of Board.	Scarlatina, 15 cases; diphtheria, 8 cases.
Toronto	M. Sutton, M.D.; C. H. Gill.	Yes; yes	Scarlatina, 9 cases; diphtheria, 5 cases, 1 death; Typhoid, 10 cases; tuberculosis. 2 deaths.
Usborne.....	A. K. Ferguson, M.D.; Francis Morley.	.....	Scarlatina, 13 cases, 1 death; typhoid, 10 cases, 2 deaths; tuberculosis, 12 cases, 4 deaths.
Uxbridge	R. E. Darling, M.D.; S. A. Flumerfelt.	Only on complaint to the Board.	Scarlatina, 3 cases; typhoid, 2 cases, 1 death; tuberculosis, 5 cases, 5 deaths.

TOWNSHIPS.—*Continued*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Isolated in their homes....	No cases	Yes	No; no
No	Don't know	Yes	No
Yes; patients are isolated in their homes.	None used.....	No	No; no
No	No diphtheria reported....	No	No; no
Yes; in private house .....	.....	Yes	Yes
.....
No; house is generally placarded.	Don't know	Don't know	No; no
Yes; house placarded and no one allowed to visit the inmates until after thorough disinfection.	Yes; has been used.....	Yes	No; no.....
As well as possible.....	Yes.....	In most cases it is	Yes; no
Yes; physician in attendance under instructions of Board.	Yes; none since last report.	No; unless requested to do so by attending physician.	Yes; no
No isolation hospital, but all cases isolated by M. H. O.	No	Yes; under direction of M. H. O.	No

TOWNSHIPS.—Continued.

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Tossorontio	No	Wells ; from to 60 ft.	No ; no
Townsend	No	Wells	No
Tyendinaga	No	Springs and wells ; for 6 to 80 ft.	No ; have not heard of any ; no.
Tiny	No	Wells ; from 10 to 100 ft. deep.	No
Tilbury, N.	Yes	Wells	No
Tuckersmith .....	.....	.....	No systematic inspection is practiced, but some tests have been made.
Thurlow	Don't think so	Wells ; from 10 to 23 ft.	No
Tilbury, E	No	Surface wells to some extent, but now largely wells from 90 to 150 ft.	No ; no
Toronto	To M. H. O. only	Wells ; 8 to 70 ft	No
Usborne	Yes	Wells ; 20 to 40 ft	No ; yes ; yes
Uxbridge	Not generally	Wells ; from 12 to 100 ft.	No ; no

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what portion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, and results of same.
One; no license . . .	No	No	None	No
Don't know; no license.	No	No	None	No
Eight to ten; no; cannot say; no.	No	No	Slaughter houses not licensed.	No
One; no		None	None	No
None			None	No
Four; not licensed, but are kept in good sanitary condition, under the supervision of the Board.				No
Six; no; offal is fed to hogs; no inspection of carcasses.	No; no; no.	None	None	No
Don't know exactly, 3 or 4; all kept in sanitary condition.	No			No
Seven; no; buried or fed to hogs; no.				No
Two; burned or buried; no.	No		None	No
One; not licensed but inspected; offal fed to hogs.	No	No		No

TOWNSHIPS.—*Continued*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Vespra	—Wallum, M.D.; Geo Sneath.	Action only taken when complaint is made to Board.	Tuberculosis, 5 cases, 5 deaths.
Verulam	C. E. Bonnell, M.D.; G. W. Taylor.	Inspection is made when complaints are received	Diphtheria, 2 cases; typhoid, 4 cases.
Williams, E.....	John Gunn, M.D.; David Wyllie.	No sanitary inspection; neither has there been any complaint of nuisance.	Scarlatina, 1 death; tuberculosis, 5 deaths.
Wellesley	Wm. Morton, M.D.; P. F. Schummer.	.....	Scarlatina, 68 cases; measles, 44 cases; typhoid, 7 cases.
Waterloo.....	H. G. Roberts, M.D.; G. A. Tilt.	Annual inspection, and when complaint is made.	Diphtheria, 30 cases; typhoid, 10 cases; tuberculosis, 4 cases.
Westminster.	G. S. Rutledge, M.D.; J. H. Anderson.	Action taken when complaints are made.	Diphtheria, 2 cases
Williamsburg	No M.H.O.; Geo. Lane.	Action taken when complaint of nuisance is made to Board.	Scarlatina, 6 cases; diphtheria, 1 case; tuberculosis, 12 cases, 8 deaths.
Wainfleet.	W. B. Hopkins, M.D.; J. H. Henderson.	Only when complaints are made.	Scarlatina, several cases.
Wilmot	J. A. Buttler, M.D.; F. Holwell.	Yes; repeated every spring and when complaints of nuisances are made.	Scarlatina, 12 cases, 1 death; diphtheria, 5 cases; typhoid, 2 cases.
Whitchurch	S. L. Freel, M.D.; C. Richardson, M.D.; J. C. Lundy.	Action taken only when complaint is made.	Scarlatina, 3 cases; diphtheria, 2 cases, 1 death; typhoid, 1 case.

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; houses placarded and isolated; no isolation hospital.	None used at present.....	Yes	No
Yes; by having patient isolated and an officer appointed by the M. H. O. to see that patient and inmates are supplied with the necessary food, etc.	Only been two cases; anti-toxine used in both cases with good results.	Yes	No; nor does it require certificates that vaccination has been performed from new school children each year; M. H. O. have urged the Board to do so, but as yet no action is taken.
No	No occasion to use it.....	.....	No
In some cases they are taken to our county hospital (Berlin).	No	Some times.....	Yes, in regard to wells and premises; no.
Yes; by having premises quarantined and supplying wants by a messenger.	Yes; with good results....	Yes ..	Yes; no.....
No hospitals; infected houses are placarded.	No.....	Yes	Yes; no
No	Don't know	Yes	No.....
No; no	Yes; almost always successful if not too late.	No.....	No; no
Yes; when possible confining inmates to house; placarding house.	Yes; results satisfactory..	All cases reported on supervision by an officer of the Board.	No; no
House placarded; family confined to house; an officer appointed to look after the inmates.	Don't know	Yes; by a member of Board or physician in attendance.	No.....

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M.H.O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Vespra	No; no	W ; from 5 to 150 ft	No; no
Verulam	Yes	From a running spring..	
Williams, E.	No	Wells; from 10 to 20 ft..	No
Wellesley	To physicians only.....	Wells; about 25 ft	No; yes.....
Waterloo	Y	Deep wells.....	Yes; no....
Westminster	No.....	Wells; 10 to 80 ft.....	Yes
Williamsbur	No.....	Wells; from 6 to 25 ft...	No; no
Wainfleet	No.....	Wells and cisterns.....	No; no
Wilmot	No.....	Wells; 20 to 25 ft.....	No; several suspected cases have been tested by tuberculin, results negative; one slaughtered animal was found to be affected; carcass destroyed.
Whitchurch	No.....	Wells; from 15 to 60 ft..	Not by Board; don't know.

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in goods anti-tary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
One; no	No	No	None	No.
None .....	.....	No	None	No.
Two; no .....	.....	.....	.....	No.
Six; kept in sanitary condition.	No	No	None	No.
13; yes; buried; no .....	.....	.....	None	No.
Three; yes; fed to hogs on premises; no.	No.....	No.....	None	No.
Four; yes.....	No.	No.....	None	No.
None	No.....	No.....	None	No.
Three; buried; no	No.....	No.	None	No.
Three; offal cooked and fed to hogs.	No.....	None.....	None	No.

TOWNSHIPS.—*Continued.*

Name of Municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board.	Contagious diseases.
Wallace	L. W. Thompson, M.D.; R. G. Roberts.	On complaint only....	Scarlatina, 6 cases, 1 death; diphtheria, 1 case, 1 death; typhoid, 1 case; tuberculosis, 1 case, 1 death.
Woolwich	Wm. B. Robinson, M.D.; J. L. Wideman.	.....	Typhoid, a few cases, no deaths; tuberculosis, 3 deaths.
Widdifield	J. B. Carruthers, M.D.; C. W. Thompson.	No; no; yes.....	None
Woodhouse	— Hamilton, M.D.; Frank Bowlby.	Yes; action taken when complaint is made.	.....
Wanwanosh, E.	John McAsh, M.D.; P. Porterfield.	Action taken only when complaint is made to Board.	General health of the township has been good.
Watt	No M.H.O.; Wm. Sword	Yes	Tuberculosis, 1 case, 1 death.
Willoughby	M. K. Colver, M.D.; H. H. Bean.	Sanitary inspection is made when complaint of nuisance is received.	Scarlatina, 7 cases, 1 death; typhoid, 1 case; tuberculosis, 1 case, 1 death.
Whitby	F. A. Dales, M.D.; D. Halliday.	Inspection usually made in May and upon complaint.	Tuberculosis, 2 cases, 2 deaths.
Whitby, E.	No M. H. O.; Wm. Purves.	Action taken when complaint is made to Board	.....
Wilberforce and N. Algona .	John Channon house, M.D.; Geo. Stone.	No	Scarlatina, 3 cases; tuberculosis, 1 case, 1 death.
Winchester.....	Humphrey Errett, M.D.; Geo. Quart.	When complaint is made to the Board.	Diphtheria, 1 case; tuberculosis, 7 cases.

TOWNSHIPS.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
The usual isolation; no hospital.	Anti-toxine used with favorable results.	No	No.....
Yes; no hospital	Yes; physicians say results are satisfactory.	Yes .....	.....
No occasion; none.....	Never had any occasion to use it.	No occasion	No; no
No isolation hospital exists; houses are placarded.	Partly in use'.....	No.....	No.....
.....
Yes; no	Don't know	Yes	No.....
No hospital; houses placarded.	Yes; results satisfactory ..	Yes.....	No; no
Have been remarkable free from contagious disease.	No.....	No occasion	Yes; no
No.....	No.....	No.....	No; no
No.....	No	No.	No.
Inmates of houses not allowed to mingle with the public.	Has been used with good results.	By physician in attendance.	No

TOWNSHIPS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Wallace.....	Yes	Wells; 12 to 40 ft.	No systematic inspection; no cases of tuberculosis.
Woolwich .....	.....	Wells; 10 to 40 ft.; water good.	Yes
Widdifield	No.....	Spring creeks.....	No.....
Woodhouse.....	Yes.....	Wells; about 50 ft.....	No; yes; tuberculin test used once.
Wanwanosh, E.....	.....	.....	.....
Watt	Yes.....	Wells.....	No.....
Willoughby	No.....	Wells; 15 ft.....	No; no
Whitby	No.....	Wells; about 30 ft	No; several tests have been made by Dominion inspectors; few cases found.
Whitby, E.....	No.....	Wells.....	No; yes.....
Wilberforce and N. Algona ..	No.....	Wells.....	No.....
Winchester.....	No.....	From wells; 20 to 30 ft.	No; no

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is the cost calculated?	Is there a public sewage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 65, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
One; offal buried; no inspection.	No system.....	No.....	None	No.
One; kept in good sanitary condition.	Yes.....	Only three houses that have sewage system.	None	No.
Two; no; fed to hogs; no.	No.....	None.....	None	No.
Two; yes; fed to hogs; no.	No.....	No.....	None	No.
.....
None; no	No.....	No.....	None	No.
Four; no ..	No.	No.....	No; other than slaughter houses.	No.
Three; not licensed; offal boiled and fed to hogs; no.	Formerly were removed by householder.	No.....	None	No.
Three; no; buried; no.	No.....	No.....	No	No.
No.....	No.....	No.....	No	No.
Three; fed to swine	Yes.....	.....	.....	.....

TOWNSHIPS.—*Concluded*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Wollaston.....	E. N. Wagner, M.D.; W. H. Nugent.	No; no; action taken only when Board is notified.	Typhoid, 3 cases.....
Walsingham, S.....	Geo. Stewart, M.D.; J. C. Thomas.	No	Typhoid, 2 cases, 1 death.
Yonge and E. Front.....	J. W. Lane, M.D.; John F. Kelly.	When complaints are made to Board.	Typhoid, 1 case; tuberculosis, 6 deaths
Yarmouth.....	—, Sanderson, M.D.; K. W. McKay.	Sanitary inspector visits all slaughter houses and attends to all complaints made to him in writing	None
York.....	T. J. Page, M.D.; W. A. Clarke.	General sanitary inspection once monthly, report by Sanitary Inspector and M.H.O.	Smallpox, 1 case; scarlatina, 29 cases, 1 death; diphtheria, 16 cases, 1 death; typhoid, 4 cases, 1 death; tuberculosis, 5 cases, 5 deaths.
Zorra, E	A. N. Hotson, M.D.; Jas. Anderson.	.....	Diphtheria, 3 cases; typhoid, 6 cases, 1 death
Zone	H. D. Graham, M.D.; Henry Osborne.	Inspections are made by order of the Board.	Typhoid, 1 case.....

TOWNSHIPS — *Concluded.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is Diphtheria Anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
No; suitable methods to meet requirements as far as practicable; no hospital.	Not in common use; have had no occasion to use it.	Yes.....	No.
Yes; no hospital	Yes; with good results ...	Yes .....	.....
No; isolated in houses as well as possible; no hospital.	No occasion to use it.....	No	No.....
No record	No record	Yes; when M.H.O. has notice and no regular physician in attendance.	No; no
Yes; under supervision of M. H. O.; no isolation hospital.	.....	Yes; by M.H.O	Yes; no
Yes; ordinary methods in private houses; no hospital.	It is becoming more generally used, with more satisfaction; 2 cases in one house, the first one refused to have anti-toxine injected, the other was treated with it and made a far better recovery.	Sometimes an officer supervises.	Yes; no
No.....	.....	None.....	.....

TOWNSHIPS.—*Concluded.*

Name of municipality.	Are forms for notification by teacher and M. H. O. of contagious diseases supplied?	Give the source of water supplied used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Wollaston	No.....	Wells, generally	No; no
Walsingham, S.....	No.....	Don't know	No.....
Yonge and E. Front.....	Yes.....	Wells; 10 to 20 ft.....	No.....
Yarmouth.....	Not by Board of Health.....	.....	No.....
York	Yes.....	Wells; about 50 ft.....	No.....
Zorra, E	Yes.....	Wells; 15 to 50 ft	No.....
Zone	M.H.O. use them.....	Wells .....	.....

TOWNSHIPS.—*Concluded.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost regulated?	Is there a public sewerage system? If so, what portion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, and results of same.
None.....	No.....	No.....	None	No.
None.....	No.....	No.....	None	No.
Two; not licensed..	No.....	No.....	None	No.
.....
About 20.....	.....	.....	One glue and refining factory, 1 pig-gery, 1 varnish factory, by permit of tp. council.	No.
Four; yes; burned or buried; no.....	.....	.....	.....	No.
Two; no license; offal fed to hogs.....	.....	.....	.....	.....

VILLAGES.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Acton.....	A. S. Elliott, M.D.; T. Moore.	General sanitary inspection.	Diphtheria, 1 case
Ailsa Craig.....	John Gunn, M.D.; E. B. Smith.	Inspection on complaint.	Scarlatina, 1 death
Alexandria	D. D. McDonald, M.D.; A. L. Smith.	Yes	Diphtheria, 2 cases; typhoid, 2 cases; tuberculosis, 4 cases, 4 deaths.
Alvinston	A. MacKinnon, M. D.; R. Code.	Only when complaint is made.	Scarlatina, about 20 cases; typhoid, 4 cases; tuberculosis, 2 cases.
Arkona	Geo. R. Watson, M.D.; T. W. Trimble.	Once a year	Scarlatina, 12 cases
Brighton	A. B. H. Dean, M.D.; J. H. Morrow.	Only on complaint to Board.	Tuberculosis, 1 case
Brussels	J. A. McNaughton, M. D.; T. S. Scott.	Yes; yes; also on complaint.	Typhoid, 2 cases.....
Beamsville	W. A. Confort, M.D.; Chas. E. Reggins.	Once a year and on complaint.	.....
Bridgeburg	J. R. Mencke, M.D.; H. Emrick.	Once a year and on complaint.	Diphtheria, 2 cases; typhoid, 1 case.
Bayfield	C. Sheppard, M.D.; H. W. Erwin.	Inspection once a year, and when complaint is made.	Typhoid, 1 case; tuberculosis, 1 case, 1 death.

VILLAGES.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Houses are placarded	Used by Dr. McDonald...	No	No; no
No; some physicians fail in making reports.	No	No	No; no
Yes	Yes; but as other remedies were used it is impossible to give definite results.	Yes	Yes; no
No; placard house	No cases	No	No; no
Yes; quarantined at residence; no hospital.	Was used in one family with good results.	Yes	No; no
Yes; isolated in residence ..	No	Yes	Health Officer does frequently; no.
Yes; by placarding houses.	None here	Yes	Yes; yes
No contagious diseases ..	No occasion for using it ..	No cause for it	Inspect schools once a year; no certificate required.
Usually placarded; none ..	Yes	Yes	No; no
Yes	No cases	No	No; no

VILLAGES.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Acton	Yes	Wells ; from 12 to 30 ft..	No ; none
Ailsa Craig	No	Wells : from 4 to 20 ft..	No ; none reported ; no..
Alexandria .....	.....	Waterworks and wells : depth, 20 to 30 ft.	No ; no ; no.....
Alvinston	No	Wells ; 8 to 10 ft.....	No
Arkona	No	Wells ; 12 ft. deep ; gravel stratum.	No inspection ; no tuberculosis as far as is known ; one test, negative result.
Brighton	No	Wells	No ; no
Brussels	Yes	Wells ; 15 to 30 ft. ; out of lime stone rock.	No ; no ; no.....
Beamsville	Yes	Waterworks and wells...	No
Bridgeburg	No	Wells ; 10 to 50 ft.....	No ; no
Bayfield	No	Wells	No ; no

VILLAGES.—*Continued.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades (Sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
None; all outside the village.	None	None	No	No.
None	Yes; night soil is put on land and ploughed under each morning; contract price for removal 43c per vault.	No	None	No.
None	Yes; costs 50c. per bbl.; paid by householder.	No	Two tanneries	Defective drainage case adjourned and done away with. Two cheese factories disposed of in similar manner.
One; no license; kept in sanitary condition; no inspection of carcasses.	No	No	None	No.
None .....	.....	No	None	Yes; one butcher sold a carcass pronounced cancerous, was tried, convicted and sent to gaol for 3 months.
None	No	No	None	No.
None	Yes	No	None	No.
None	No; removed by householder.	No	None	No.
None	No	No	None	No.
One; no	No	No	None	No.

VILLAGES.—Continued.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Beeton	D. J. Dunn, M.D.; Jos. Wright.	Yes, and when complaints are made.	Tuberculosis, 1 case
Belle River	Wm. Anderson, M.D.; D. Dumouchelle.	Action taken only when complaint is made.	.....
Burlington	A. H. Speers, M. D.; James Allan.	Sanitary inspection once a year, and also when complaint is made.	Typhoid, 17 cases. 1 death; tuberculosis, 1 case.
Beaverton	A. Grant, M.D.; C. A. Patterson.	Yes; twice a year.	Tuberculosis. 2 cases, 2 deaths.
Bolton	D. Bonnar, M.D.; John McDonald.	General inspection at intervals.	Diphtheria, 1 case
Bath	H. S. Northmore, M.D.; Max Robinson.	Yes, at intervals	Scarlatina, 1 case; diphtheria, 2 cases.
Burk's Falls	Wm. Crawford, M. D.; E. Bezett.	Action taken by M.H.O. when complaints are made; annual inspection by S.I.	Scarlatina. 5 cases; typhoid, 3 cases.
Bobcaygeon	C. E. Bonnell, M. D.; Chas. S. Stewart.	Sanitary inspector keeps a general oversight.	Typhoid, 4 cases
Chesterville	No M. H. O.; Mileo Knowland.	Yes; repeated at intervals.	Typhoid, 1 case
Cardinal	Duncan Gow, M. D.; James Covil.	Yes; spring and fall...	Tuberculosis, 1 case

VILLAGES—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes	Yes .....	.....	No; no
Houses placarded; no hospital.	No occasion to use it.	Yes	No
Houses placarded	No cases of diphtheria	No; instructions given by medical attendant.	No
Yes, as far as possible by confining the inmates to the house where the disease exists	No	Yes	No
Yes; patients confined in a room, no communication allowed with any member of the family; no hospital.	Yes, when necessary	Generally by physicians in attendance or M.H. O. when necessary.	No; no
Yes; houses placarded and inmates isolated.	Yes; in one family parents had diphtheria. Antitoxine was used with good results. Two children were immunized; neither developed any symptoms.	Yes	No
Yes; houses quarantined ..	Yes	Yes	No
Isolation and the house placarded.	Not yet used	Yes	No
Yes; by confining patient to one room, no hospital.	No cases	Yes	Yes; no
Isolated in their own homes	No diphtheria	Under direction of M. H.O.	No; no

VILLAGES.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M.H.O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	If there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Beeton	Yes	Wells; about 14 ft.....	No; no.....
Belle River	Yes	Wells; about 12 ft.....	No; no.....
Burlington	No	Wells; about 30 to 35 ft	No; no tuberculosis
Beaverton	No	Wells	No; no.....
Bolton	No	Wells; about 16 ft....	No
Bath	No	Principally from Bay Quinte.	None
Burk's Falls.....	No	Wells; about 20 ft.....	No
Bobcaygeon	No	Springs and wells	No; no
Chesterville	No	Wells; about 20 feet....	No; no; not used
Cardinal	No	St. Lawrence River.....	No

VILLAGES.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what portion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
One; no license; no	No	No		No.
None	No	No	None	No.
None	No	No	None	No.
None	Yes; done at the expense of owner.	No	None	No.
Three slaughter houses; not licensed; under a by-law of village, upon conviction of any breach of provisions are liable to a fine of \$5.00; offal cooked and fed to swine.	Farmers and others remove night soil.	No	None	No.
Two; offal goes principally fed to pigs.	Yes; under inspection of M.H.O.	No	None	No.
None	No	No	None	No.
Three; erected by permission of Board; fed chiefly to hogs.	No	No	None	No.
One; not licensed, but kept in good sanitary condition; no inspection of carcasses.	No; work of this kind is done by private parties.	No	None	
None	No	No	None	No.

VILLAGES.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Oayuga	Wm. Kerr, M.D.; E. O. Campbell.	Yes; repeated at intervals, both by order of Board and when complaint is made.	Tuberculosis, 1 case; typhoid, 2 cases.
Chippawa	Andrew Grey, M. D.; Wm. Greenwood.	Sanitary inspection once a year.	None reported.....
Colborne	N. E. Mallory, M. D.; Geo. Keys.	Yes; no; also when complaints are made.	Scarlatina, 6 cases; typhoid, 6 cases; measles, 10 cases.
Oaledonia	W. J. Burns, M. D.; James Old.	When complaint is made.	None
Chesley	Geo. Cooke, M.D.; Jas. McNeil.	Yes; yes	Scarlatina, 1 case
Creemore	— Dack, M.D.; A. H. Watson.	Yes; yes; twice each year.	Scarlatina, 1 case
Casselman.....	No M.H.O.; J. A. Ridell.	Only when complaint is made.]	Diphtheria, 5 cases, 2 deaths; typhoid, 7 cases.
Clifford	H. Ros, M.D.; R. E. Bigger.	General inspection twice a year, and when complaints are made.	Scarlatina, 1 case; diphtheria, 1 case; typhoid, 2 cases.
Dundalk	Jas. McWilliam, M.D.; W. J. Wardell.	Yes; yes	Diphtheria, 1 case
Dunnville	N. Hopkins, M.D.; J. W. Holmes.	Every spring, and when considered necessary, or when complaint is made.	Diphtheria, 6 cases; typhoid, 4 cases.
Delhi	R. B. Wells, M. D.; Roger Crysler.	Yes; yes; also action taken by Board on complaint.	Scarlatina, 2 cases; typhoid, 1 case; tuberculosis, 2 cases, 2 deaths.

VILLAGES — *Continued*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; isolated at their homes; no hospital.	Yes; successful in all cases where it has been used.	Yes	No; no
No occasion	No diphtheria	No	No; no
Yes; residence placarded, and special constable placed in charge	No	Yes	No; no
No	Yes	No	No; no
Yes; complete isolation of each dwelling, and disinfection of each occupant before being allowed to mingle with the public.	Have had no diphtheria for some years.	Yes	Yes; no
Yes .....	.....	Yes	Yes; no
Yes; no hospital	Used in 3 cases, with good results.	Yes	No
No hospital; physician isolates patients.	Not used, as very few cases have occurred.	No; medical attendant looks after it.	No; no
Yes; house placarded; ingress and egress strictly prohibited; no hospital.	No	Yes	Yes; no certificate required.
Patients are isolated at home.	Yes; physicians are well pleased with anti-toxine, and report favorable in all cases.	Yes	No
Isolation is carried out as far as possible.	Anti-toxine used in all cases; treatment thus far very satisfactory.	Under M. H. O	Yes; no

VILLAGES.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Cayuga	No	Cistern and very few wells.	No; one known case; no test applied.
Chippawa	No	Wells; from 14 to 20 ft.	No
Colborne	No	Wells; 12 ft	No no
Caledonia	Yes	Wells; 25 to 50 ft	No; no
Chesley	Yes	Wells; from 10 to 40 ft.	None
Creemore	Yes	Wells; about 12 ft.	None
Casselman	No .....	.....	No
Clifford	Yes	Wells; 20 to 40 ft	No
Dundalk	Yes	Wells; usual depth 25 ft.	No; no cases of tuberculosis.
Dunnville	Yes	Wells; about 12 ft. deep.	No
Delhi	No	Wells; about 20 ft	No

VILLAGES.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
One; no; no	No	No	None	No.
None	Each householder looks after their own.	No	None	No.
None	No; owners pay cost; special rates.	No	None	No.
Two; yes	No	None	No	No.
None	Night soil removed at a cost of \$1.20 per family annually.	No	None	Yes; 2 parties fined for burying night soil in the village contrary to by-law.
One; no license; not inspected.	No	No	None	No.
One; not licensed; no	No	No	None	No.
Two	No; removed by householder.	No	None	No.
One; yes; cooked and fed to hogs; no.	No	No	None	No.
None in municipality	No	No	None	No.
None; no inspection of carcasses.	No	No	None	No.

VILLAGES.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board.	Contagious diseases
Eganville	F. D. Galligan, M.D.; J. A. Kilts.	Five inspections made yearly.	Scarlatina, 1 case; typhoid, 2 cases.
Embro	John Ross, M.D.; E. Cody.	One annual inspection, and at intervals if deemed necessary.	None
East Toronto	C. A. Britton, M.D.; W. A. Clay.	Action taken only when complaint is made.	Scarlatina, 2 cases
Elora	No M. H. O.; W. A. Petrie.	Yes; yes	Scarlatina, 12 cases; diphtheria, 1 case; tuberculosis, 2 cases, 2 deaths.
Erin	No M. H. O.; Wm. Conboy.	Yes; one or two inspections, and when complaints are made.	Scarlatina, 8 cases; tuberculosis, 1 case, 1 death.
Fergus	W. H. Johnson, M.D.; William Ross.	General and special .....	.....
Fort Erie	D. W. Douglas, M.D.; B. F. Mathews.	General inspection; sometimes repeated by order of the Board.	Diphtheria, 3 cases; tuberculosis, 1 case.
Fenelon Falls	A. Wilson, M.D.; Wm. F. Junkin.	Yes; only in the spring, and when complaints are made.	Scarlatina, a few cases; tuberculosis, 1 case, 1 death.
Grand Valley	Geo. J. Campbell, M.D.; Wm. McIntyre.	Yes	Scarlatina, 2 cases; diphtheria, 1 case, 1 death; tuberculosis, 1 case.
Chinbrook	J. G. Smith, M.D.; W. A. Mason.	General inspection about 1st May, and when complaints are made.	Diphtheria, 5 cases; tuberculosis, 7 deaths.
Hensall	Jas. Macdiarmid, M.D.; H. J. D. Cooke.	Yes; it is repeated at intervals every year.	None

VILLAGES.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
House is isolated; sanitary inspector placed in charge	.....	Yes	No
Isolation when necessary; no hospital.	Yes; results have been good.	Yes	Yes; no
No; no hospital .....	.....	Yes	No; no
No hospital; houses placarded and children kept from school.	Yes; results good	No, not always	No; no
Houses placarded and inmates not allowed to mingle with the public.	No	Under supervision of medical attendant.	Yes
Yes; placarding residence.	Yes; no cases for a long time.	Yes; under supervision of M. H. O.	No
As far as possible isolation is carried out; no isolation hospital.	Yes; the M.H.O. reports good results from its use.	To some extent	No; no
No; no hospital; in diphtheria strict measures are adopted.	Yes; a physician would not be considered doing his duty if he did not administer anti-toxine.	Yes generally; especially in diphtheria cases,	No; no
Yes; in scarlet fever patient placed in separate building, waited upon by one nurse; in diphtheria patient isolated in one room and house placarded.	Yes; used in fatal case; it has been used outside municipality with success.	Yes	No; schools are inspected by M. H. O.
Yes; isolation hospital, Ottawa.	Yes; results of anti-toxine very favorable.	Yes; M. H. O	No
No contagious diseases this year; when necessary it is carried out.	No diphtheria this year	No	Yes; no certificate of vaccination.

VILLAGES.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Eganville	Yes	Wells; 25 to 35 ft. deep.	No; no
Embro	Yes	Wells; 30 ft .....	.....
East Toronto	No	Springs	No; no
Elora	No	Wells; from 8 to 12 ft.	No; no
Erin	Yes	Wells; 30 ft. deep	No; no test.....
Fergus	To M.H.O. and M.D's..	Wells; 20 to 25 ft.....	No dairy in municipality
For Erie	No	From wells	No; no
Fenelon Falls	No	Wells; average about 15 ft.	No
Grand Valley	No	Wells; artesian, over 100 ft.	No
Hinchinbrook	No	Wells; 12 to 16 ft.....	Ottawa inspection considered sufficient—Hinchinbrook being a suburb.
Hensall	No	Wells; 25 or 30 ft.....	No; no

VILLAGES — *Continued.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
None.....	No	No	None	No.
One; kept in good condition.	No	No	None	No.
None	Garbage is removed annually by municipality; night soil by householders.	None	No	No.
Three; no license; inspection at intervals; no inspection of carcasses.	No; private.....	No	None	No.
None; no; no	No	No	None	No.
Two; not licensed, but are inspected.	No	No	None	No.
Two; not licensed; offal is fed to hogs or buried in manure piles; no inspection of carcasses.	No	No	Two slaughter houses; not licensed.	One party was prosecuted and fined for leaving offal in manure pile.
None	No; done by private contract.	No	No	No.
One; no; fed to hogs, no.	No	No	None	No.
None	Night soil removed by contractor holding permit from Board at \$1 00 for every 16 cubic ft.	No; none.....	None	No.
None	No	No	None	None.

VILLAGES.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to board?	Contagious diseases.
Hagersville	Robert McDonald, M.D.; John H. Scott.	General sanitary inspection, and action taken on complaint.	Diphtheria, 2 cases, 2 deaths.
Hastings	Rich'd. Coughlan, M.D.; A. Wilson.	General sanitary inspection twice a year.	None
Holland Landing	No M.H.O.; F. J. Sheppard.	Yes	Tuberculosis, 1 case, 1 death.
Iroquois	D. Johnston, M. D.; Allan McInnis.	Sanitary inspector makes two inspections annually.	Tuberculosis, 3 deaths ..
Kingsville	P. D. White, M.D.; W. A. Smith.	Yes; regular inspection.	Diphtheria, 2 cases
Lakefield	Alex. Bell, M.D.	Twice a year and when required.	Typhoid, 2 cases; tuberculosis, 2 deaths.
Lucknow	A. G. Elliott, M. D.; Hugh Morrison.	One general inspection by sanitary inspector in May, who also investigates complaints.	Tuberculosis, 2 cases....
Lanark	No M.H.O.; W. A. Field.	Yes; twice in the year or by sanitary inspector.	Diphtheria, 1 case
Lucan	—, Shaw, M.D.; Geo. A. Stanley.	Yes; twice a year	Scarlatina, 1 case
Millbrook	N. C. McKinnon, M.D.; William Turner.	Yes; inspected carefully every spring.	Tuberculosis, 1 death ...

VILLAGES.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; patients and attendants isolated; house placarded; no hospital.	No	Yes, thoroughly	Yes; once a year
No occasion	No; have not had an outbreak of diphtheria since introduction of anti-toxine.	Yes	No; no
Yes; none	Don't know	Yes	Yes; yes
None			
Yes; house containing patient quarantined; all exposed persons quarantined.	Yes, with immediate and satisfactory results; the beneficial effects of anti-toxine are distinctly noticeable.	Yes	Yes; no
Yes; isolated in room; no hospital.	No	Yes; by M.H.O.	No, but Board are having all children not vaccinated done next week, and in future certificates will be required.
No M.H.O.; only placards house in which disease exists.	Have had no cases for some years.	M.H.O. looks after disinfection.	No; no
Yes; houses quarantined and fumigated.	.....	Yes, but not by latest improved methods.	No; no
No	None used	Yes	No; no
Yes; generally sent to Nichols' hospital, Peterboro'.	Don't know	Yes	Yes; no

VILLAGES.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from well, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Hagersville	No	Wells, 12 to 18 feet; drilled wells from 50 to 100 ft.	No; no dairy in the municipality; M.H.O. has inspected principal dairy outside of village and found it in a most satisfactory condition.
Hastings	No	Wells, natural springs ..	No; no
Holland Landing	Yes	Wells; 25 to 40 ft	No; no
Iroquois .....	.....	.....	.....
Kingsville	To M.H.O	Water supply from lake and wells occasionally when not condemned.	No
Lakefield	Yes	Wells and river; 15 to 25 feet average depth of wells.	No
Lucknow	No	Wells: 25 ft deep	No
Lanark	Yes	Wells; 20 to 40 ft	No; have not heard of any cases of tuberculosis.
Lucan	No	Wells	No
Millbrook	No	Spring water, conducted by pipes.	No

VILLAGES. — *Continued.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, and results of same.
One; yes; fed to hogs.	No; night soil removed by occupants and buried in fields adjoining the village; garbage removed in similar way.	No	Slaughter-house regulated by Board of Health.	No.
One at outskirts of village; fed to hogs; no.	No	No	No	No.
None	No	No	None	No.
None	No	No	No	No.
None	No	No	No	No.
None allowed	Each householder removes or destroys their own; deep closets cleaned once or twice a year.	No	None	No.
None; not allowed in the municipality.	No; every householder supposed to remove night soil when ordered by sanitary inspector.	No	None	No.
One; not licensed; fed to hogs; no.	No	No	One slaughter house; not licensed.	None.
None	No	No	None	No.
Two; not licensed; boiled and fed to hogs.	No	No	None	No.

VILLAGES.—*Continued.*

Name of municipality.	Name of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Madoc	E. D. Harrison, M.D.; B. O'Hara.	Yes . . . . .	.....
Maxville	Jas. T. Munro, M.D.; Chas. McNaughton.	Only when complaints are made.	Typhoid, 2 cases; tuberculosis, 2 cases.
Milverton	Wm. Egbert, M.D.; W. D. Weir.	Yes; each year.	None
Merrickville	No M.H.O.; J. Johnston	Annual	No
Newcastle	Dr. A. Farncomb; G. W. Curtis.	General inspection at intervals.	None
Norwood	G. A. Pettigrew, M.D.; James Calder.	Yes; every year	None
Newboro'	R. King, M.D.; L. S. Lewis.	Yes; once a year	None
Newburgh	W. J. Beeman, M.D.; Chas. Welbanks.	Yes; yes.	Tuberculosis, 1 case, 1 death.
Norwich	E. E. Harvey, M.D.; Wm. Fairley.	General inspection during every week, afterwards when complaints are made.	Scarlatina, 5 cases, 2 deaths; typhoid, 14 cases, 2 deaths; tuberculosis, 2 deaths.
Oil Springs	No M.H.O.; D. P. Sick.	Yes; sanitary inspector inspects three or four times a year.	Scarlatina, 4 cases; diphtheria, 1 case, 1 death.
Omeme	T. S. Cameron, M.P.; D. A. Balfour.	Only when complaint is made.	Typhoid, 2 cases

VILLAGES.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
.....	.....	.....	No; no
Yes; isolated on premises.	The medical health officer has used it with very satisfactory results.	Yes	No; no
No	No	No	No; no
No	Don't know	Yes	No; no
No isolation or hospital ...	Occasionally	Yes	School inspected; no enforcement of vaccination.
Yes	Yes	Yes	Yes; no
Had no occasion	Two cases; physicians say they keep it.	It would be	Inspected once a year; vaccination certificate not required.
Yes	No cases	Yes	Yes
Patients isolated as much as possible in their home; no hospital.	No	After scarlatina or diphtheria it is usual for inspector to supervise the disinfection of the houses.	No; no
No hospital; home strictly quarantined.	.....	No; generally done by physician in charge.	Sanitary inspector inspects schools; no certificate required.
Yes; no hospital.	No cases; cannot say	No	No; no

VILLAGES.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Madoc	No	Wells; 20 to 30 ft	No
Maxville	Yes	Wells; 20 to 24 ft	No
Milverton	No	Wells; about 10 ft	No
Merrickville	Dcn't know	Wells; cannot say	No
Newcastle	Yes; to M.H.O	Wells; from 6 to 8 ft. deep.	No inspectors of dairy cows.
Norwood	No	Wells	No; no
Newboro'	Yes	Wells; 10 to 30 ft.	No; no
Newburgh	No	Springs	No
Norwich	Yes	Wells; from 20 to 60 ft. .	No inspection
Oil Springs	No .....	.....	None
Omeme	No	Wells; 15 to 20 ft	No

VILLAGES.—*Continued.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
Two; no; no	Yes	No	None	No.
Two; no	No	No	None	No.
One	No	No	Piggery in connection with cheese factory.	No.
None	No	No	None	No.
One	Buried or burned	No	No	No.
None	Yes	No	None	No.
None	No	No	None	No.
One; no	Each party looks after their own.	No	One tannery; 1 cheese factory; 1 slaughter house.	No.
One; not licensed, but inspected.	Each householder responsible for his own garbage and night soil.	None	None	No.
.....	Garbage and night soil is removed by scavengers at 50c per bbl.	No	None	No.
None; no; no	No	No	None	No.

TOWNSHIPS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Paisley.	M. C. Black, M.D.; N. McKechnie.	Sometimes it is repeated.	None.....
Parkhill.	Thos. Ovens, M.D.; J. A. Mabury.	Yes, and when complaint is made.	Scarlatina, 10 cases; diphtheria, 4 cases; tuberculosis, 1 case, 1 death.
Portsmouth.	No M.H.O.; Thos. Kelly.	General inspection in the spring.	Typhoid, 1 case; tuberculosis, 1 case, 1 death.
Port Stanley.	L. J. Mothersill, M.D.; James Gough.	Yes; repeated during the year.	Scarlatina, 3 cases, 1 death; tuberculosis, 1 case, 1 death.
Port Colborne.	J. B. Neff, M.D.; Frank D. Noble.	Only when complaints are made to Board.	Tuberculosis, 1 case.....
Port Dalhousie.	J. H. Considine, M.D., Sec'y.	General sanitary inspections twice a year and when complaints are made.	Scarlatina, 1 case; typhoid, 1 case.
Port Carling.	— Canniff, M.D.; R. G. Pearson.	Sanitary inspection is made at intervals every year, and general inspection every spring.	.....
Point Edward.	A. N. Hays, M.D.; W. Mitchell.	Action taken when complaint of nuisance is made to Board.	Typhoid, 2 cases.....
Port Rowan.	E. Meek, M.D.; Jas. Ryan.	Once in a year, and when complaints are made.	None.....
Port Perry.	D. Archer, M.D.; F. M. Yarnold.	Yes; by sanitary inspector and on complaint to Board.	Scarlatina, 2 cases, 1 death; tuberculosis, 2 cases, 2 deaths.
Richmond.	R. C. Channonhouse, M.D.; John Reilly.	When complaint of nuisance is made to Board.	Typhoid, 10 cases, 1 death
Rockland.	W. D. Ferguson, M.D.; A. E. Erskine.	General sanitary inspection twice a year.	Scarlatina, 2 cases; typhoid, 6 cases; tuberculosis, 10 cases.

TOWNSHIPS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; no hospital.	No	Yes.	Yes.
Yes	Yes; favorable	By M.H.O. or physician in attendance.	No; no
Usually removed to city hospital, Kingston.	Yes; no cases this year...	No	No; no
Yes; infected houses quarantined; no hospital.	Yes; results good in 1897.	Yes; M.H.O.	No....
No; placarding	Yes; results good	No	No.....
Yes; as far as possible....	None required.....	Yes.	None.....
No; no occasion.....	No; no diphtheria.....	Yes; when any cases occur.	Yes; no.
No isolation.....	Yes.	Yes.	Inspected several times yearly. No certificates of vaccination this year.
Only by placard	Anti-toxine is furnished by the municipality to M. H.O.	.....	No; no
Yes; confined in separate part of dwelling; no isolation hospital.	Yes; results very satisfactory.	By physician in attendance: ordinary methods.	Yes: no.....
Yes.	Yes.	Yes.	Yes; no.
Yes. ....	.....	Yes.	No.....

TOWNSHIPS,—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Paisley.	Yes	Wells.....	No.....
Parkhill	Yes.	Wells ; 180 ft. deep	No.
Portsmouth	No	Wells	No.....
Port Stanley.....	No	Wells	No.....
Port Colborne	No	Water works system....	No.....
Port Dalhousie.	None	Springs	Yes; none.....
Port Carling.....	Cannot say	Spring wells	No.....
Point Edward	Yes.	Wells ; 15 to 20 ft	No inspection of dairy cows ; no cases of tuberculosis.
Port Rowan.....	No ; yes	Wells ; 36 to 40 ft	No dairy in municipality.
Port Perry	Physicians only.....	Wells ; 18 ft.....	No ; no dairy cows in municipality.
Richmond.....	No	Wells ; 18 ft.....	No ; no ; no.....
Rockland	No	Ottawa River.....	No

TOWNSHIPS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what portion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under the Public Health Act? State in detail the nature of the case, and results of same.
None	No.....	No.....	None	No.
None	Yes; 1 to 4 in family 50c; 6 to 8 in family 60c.	No.....	None	No.
None	No; except in spring time.	No.....	None	No.
Two; permit from council; offal is fed to hogs.	No.....	No.....		No.
None	No.....	No.....	None	No.
One; in good condition.	None	No.....	None	No.
One; offal buried; inspection is made by Board of Health	Night soil is disposed of in usual way and inspection is made.	No.....	None	No.
None	No regular system; generally buried or burned.	No.....	None	No.
Not allowed; within corporation.	No.....	No	None	No.
None	No	No	None	No.
One; no; drawn away; no.	No.....	No.....	None	No.
None	No	No.....	None	No.

VILLAGES — *Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? Or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Richmond Hill.	No. M.H.O. ; M. Teefy.	Yes, by inspector .....	.....
Sturgeon Falls.....	L. E. Bolster, M.D. ; H. E. McKee.	.....	None.....
Southampton	P. J. Scott, M.D. ; James Howe.	.....	Diphtheria, 4 cases, 1 death; typhoid, 3 cases.
Shelburne	R. W. Rooney, M.D. ; D. C. Dunbear.	Yes; annual inspection and when complaint is made.	.....
Stouffville	J. A. Freel, M.D. ; A. G. Brown.	Once a year	Typhoid, 3 cases; scarlatina, 1 case; tuberculosis, 2 cases.
Streetsville	No. M. H. O. ; D. J. Pinney.	Two; house to house inspections in the year.	Tuberculosis, 6 cases, 6 deaths.
Stirling	J. S. Sprague, M. D. ; John S. Black.	Yes; repeated at intervals.	Diphtheria, 4 cases.....
Sundridge.....	A. Carmichael, M. D. ; J. Dunn.	Yes; inspection made yearly.	Diphtheria, 1 case; tuberculosis, 5 cases 1 death.
Springfield	R. W. Shaw, M.D. ; J. B. Lucas.	Yes; yes.	Typhoid, 1 case
Stayner	Chas. E. Jakeway, M.D.	Yes; yes	Tuberculosis, 1.

VILLAGES.—*Continued.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxin in common use by physician? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; no hospital. ....	.....	Yes.	Don't known.
Yes; houses quarantined.	Yes.	Yes.	No; no
Yes.	No	Yes.	Yes; no
Yes; no isolation hospital; house is quarantined.	Yes; two cases of diphtheritic-croup far advanced, recovered under its treatment; anti-toxine is admitted to be a successful treatment by physicians here when used in time.	Yes.	No; no
Not always; no hospital..	No cases.	Generally by physicians in attendance.	No
No hospital exists ....	.....	Yes.	Yes; certificate of vaccination not required.
Yes; quarantined; no hospital.	Yes; satisfactory in connection with old tried and reliable remedies.	Yes.	Yes; no.
Yes; isolated at patients home.	When needed.....	Yes.	No; no
No; cases quarantined....	Yes.	Yes.	Yes; no.....
Not very well; houses placarded.	No diphtheria for several years.	No.....	No; no

VILLAGES.—*Continued*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Richmond Hill.....	Don't know	Wells	No
Sturgeon Falls	No	Wells; 12 ft.....	No
Southampton.....	No	Wells; 16 to 18 ft	No; no
Shelburne	No	Water source from well; 480 deep.	No test; no inspection..
Stouffville.....	Yes.....	Supplied by gravitation from springs and wells.	No; none reported.....
Streetsville	Physicians only	Wells: 35 ft.....	No systematic inspection of dairy cows; premises are inspected by sanitary inspector; no cases of tuberculosis have been discovered.
Stirling	No	Wells; 30 ft.....	No; no.....
Sundridge.	Yes.	Springs.....	No; no
Springfield.	No	Wells	No; no
Stayner.	No	Don't know	No.....

VILLAGES.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
Two	No system	No	Slaughterhouses	No.
None	No	No	None	No.
Two; no	No	No	None	No.
Three; outside corporation.	No	No		The parties summoned before magistrate for unsanitary condition of premises or yards were not fined but had to pay costs, and comply with demands of inspector.
Two; no; don't know; no.	No	No	None	None.
Two; licensed; offal fed to hogs; no inspection of carcasses.	No	No	None	No.
None	No	No	None	No.
One; no; buried; no.	No	No	None	No.
Two; no; buried...	No	No	None	No.
None	No	No	None	No.

VILLAGES.—Continued.

*Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Sutton.	C. T. Noble, M.D.; T. K. Barnard.	General sanitary inspection.	Scarlatina, 1 or 2 cases; diphtheria, 1 case. . . .
Tweed	W. M. Mather, M. D.; Wm. Wray.	Yes; once a year, in general and when complaint is made.	Scarlatina, a few light cases; typhoid, 3 cases, 1 death; diphtheria, 12 cases, 1 death.
Tara	Thos. Wilson, M.D.; D. J. Tobey.	Yes; action taken only by complaint.	Diphtheria, 6 cases, 1 death.
Thedford	No M. H. O.; Wm. Brooks.	Yes; twice yearly.	Scarlatina, 2 cases
Thornbury	G. W. Hurlburt, M.D.; E. Rorke.	General sanitary inspection each year.	. . . . .
Tilbury	M. Sharp, M.D.; A. A. Wilson.	Yes; repeated	Typhoid, 3 cases; diphtheria, 1 death; tuberculosis, 1 case, 1 death.
Tiverton	W. J. Chambers, M.D.; J. S. Evans.	Action taken when necessary.	Scarlatina, 1 case
Venna	J. H. Hoover, M. D.; W. Watts.	Action taken when complaint of nuisance is made to Board.	Scarlatina, 2 cases
Wellington	J. B. Ruttan, M. D.; Thos. S. Stinson.	No; no; only when complaint is made.	Diphtheria, 2 cases.
Weston	E. F. Irwin, M.D.; R. H. Leighton.	General inspection every spring.	Scarlatina, 10 cases; diphtheria, 1 case; typhoid, 1 case; tuberculosis, 1 case, 1 death.
Wioxeter	No M. H. O.; J. Cowan.	No.	None

VILLAGES.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes.	Used when any cases occur.	Yes.	No; no
Yes; as far as possible....	Used in some cases	Yes.	Yes; no.....
Yes	No	Yes; M.H.O	No
No hospital, but always isolated from other members of the family.	Yes	Yes; by M.H.O	Yes; yes
Houses placarded	Yes	Yes	Yes; no.....
Yes.....	No cases	No	No
No hospital .....	.....	Yes .....	.....
No hospital	Don't know	Yes	Don't know
Yes; in the homes of patients; no hospital.	Yes	Under supervision of M. H. O.	No; no
Yes; no hospital	Yes; results good	Yes	No
No.....	No	No	No

VILLAGES.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Sutton	Yes.	Wells	No ; no
Tweed		Wells	Yes
Tara	No	Wells, 15 to 30 ft	No ; no
Thedford		Wells, 30 ft	Twice each year
Thornbury	No	Wells, 15 to 25 ft	No dairy cows in corporation.
Tilbury	No	Wells, 6 to 8 ft	No
Tiverton		Wells, 20 to 30 ft	No
Vienna	Yes	Wells, from 16 to 20 ft.. . . .	Don't know
Wellington	No	Wells, 7 to 20 ft	No ; no ; no
Weston	No	Wells, 18 to 20 ft	No
Wroxeter	No	Wells	No

VILLAGES.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
Two; no systematic inspection of carcasses.	No	No	Slaughterhouses	No.
One buried and fed to hogs.	No	No	one	No.
One; yes; offal buried; yes.	No	No	None	No.
None.....	No	No	None.....	No.
Two	No	No	None.....	No.
None.....	No	No	None.....	No.
One.....	.....	.....	.....	.....
Two; no	No.....	No.....	None.....	No.
One; no	No.....	No.....	None.....	No.
Six licensed; buried; no.	No.	No.....	None.....	No.
.....	None.....	No.....	None.....	No.

VILLAGES.—*Concluded.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board.	Contagious diseases.
Woodbridge	No. M. H. O.; J. McClure.	Yes; twice a year	None
Waterford	A. T. Gould, M. D.; S. Cunningham.	Only when complaint is made.	Diphtheria, 1 case; typhoid, 1 case.
Winchester	P. McLaughlin, M. D.; N. W. Beach.	Yes; twice yearly	None
Wardsville	J. T. McKillop, M. D.; D. Johnson.	Only when complaint is made.	None
Waterdown	J. D. McGregor, M. D.; G. F. Green.	General sanitary inspection; action taken only on complaint.	Scarlatina, 2 cases; diphtheria, 1 case; tuberculosis, 1 case.
Woodville	J. Grant, M. D.; J. C. Gilchrist.	Yes	Typhoid, 1 case; tuberculosis, 1 case, 1 death.

VILLAGES.—*Concluded.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
No occasion	No occasion	Yes	Yes
No.....	Don't know	No	No
Yes; in home of patient; no hospital.	Yes; satisfactory	Under direction of M. H. O.	No; no
Isolation of homes and quarantine of house.	Yes	Yes	No; no
Yes; no isolation hospital.	Yes; results good	Yes	No; no
Yes; no hospital; house placarded.	No	Yes	No

VILLAGES.—*Concluded.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Woodbridge	Yes	Wells, 30 ft	Have no dairies
Waterford	No	Wells	No
Winchester	Yes	Wells, 15 to 20 ft	No ; no
Wardsville	No	Wells, 12 to 20 ft	No ; no
Waterdown	Yes	Wells, average depth, 20 ft.	No
Woodville	No	Wells, 20 to 30 ft. deep	No.

VILLAGES.—*Concluded*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the health department?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what portion of houses of whole village is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63 Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
Two; offal taken outside municipality and fed to hogs; no inspection of carcasses.	All buried	No.	None.	No.
None.	Yes	No.	None.	No.
None.	Night soil is removed annually.	Sewers or drains for surface drainage.	None.	No.
None.	Removed by householder.	No.	None.	No.
None.	No.	No.	None.	No.
None.	No.	No.	None.	No.

TOWNS.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Alliston.. .. .	J. J. Harper, M. D.; W. M. Lockhart.	Yes; yes	Tuberculosis, 3 deaths..
Aurora	No M.H.O.; S. Lundy.	Action taken only when complaint is made	None.....
Aylmer	G. F. Clarke, M. D.; Junius Bradley.	Inspection twice each year, in May and September; action taken when complaint is made	Typhoid, 1 case; tuberculosis, 1 case.
Almonte	No M.H.O.; L. Coulter.	Yes; yes; action also taken on complaint.	Scarlatina, 25 cases, 1 death; diphtheria, 1 case.
Bowmanville	A. S. Tilley, M.D.; John Lyle.	When complaint is made.	Scarlatina, 10 cases; diphtheria, 5 cases; typhoid, 15.
Berlin.....	J. E. Hett, M. D.; H. Aletter.	General inspection.....	Scarlatina, 4 cases; diphtheria, 63 cases, 7 deaths; typhoid, 45 cases, 1 death; tuberculosis, 8 deaths.
Brampton	J. T. Mullin, M. D.; T. J. Blain.	Yes; yes	Tuberculosis, 5 cases, 5 deaths.
Brockville	Harry E. Vaux, M. D.; G. A. McMullen.	Yes; yes; prompt action taken on all complaints	Scarlatina, 19 cases, 1 death; diphtheria, 28 cases, 5 deaths; typhoid, 22 cases, 3 deaths; tuberculosis, 22 cases, 22 deaths.
Bracebridge	No M.H.O.; Jas. Boyer.	Action taken only when complaint is made.	None reported.....

TOWNS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; no hospital	No occasion	Yes	No; no
Yes; when required; no..	Don't know	Yes	No
No; only in cases of small-pox and scarlatina.	.....	Yes	No; no
No hospital	Yes; successful	Yes	No
Yes; no hospital	No	No	No; no
Yes; isolated in their respective homes; isolation hospital now in course of erection.	Yes; very satisfactory if used in due time.	Yes	No
Yes; usual methods	Yes	Yes	Yes; no
Yes; at both hospitals; also at patients' houses.	Physicians report a number of cases with favorable results.	Yes; by sanitary inspector with formaldehyde.	Yes; no
Yes; by sanitary inspector placarding houses; no hospital.	No	Yes	Inspector does; no

TOWNS.—Continued.

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Alliston	Yes	Wells, 15 ft	No; none
Aurora	Yes	Waterworks from springs and wells.	No
Aylmer	No	Wells, from 8 to 25 ft...	No; no; no
Almonte	Only to physicians .....	.....	No; no no tuberculosis
Bowmanville	Yes	Wells	No; yes; yes
Berlin	Yes	Supplied from waterworks.	Inspection not systematic; occasional by our meat and milk inspector; no; no
Brampton	Yes	Wells, 20 ft	Yes; no
Brockville	Yes	St. Lawrence river; only a few wells now in use, and they are inspected and tested.	Yes; by sanitary inspector: none reported; no tuberculin test enforced now.
Bracebridge	No	Springs	No; no

TOWNS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what portion of houses to which is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
Two; offal said to be buried.	No	About $\frac{1}{3}$	Two slaughterhouses; No. 2 tanneries.	
One; licensed	No	No	None	No.
None in municipality; all in township.	Yes; all by the week or month; garbage in spring and fall.	No	Four slaughterhouses; not inspected.	Yes; the nuisance being removed, case was allowed to drop.
Two; not licensed; no inspection of carcasses.	Removed at the instance of sanitary inspector; cost is paid by householders.	No	None	No.
Four; yes; yes	No	No	None	No.
Three; yes; fertilizer; inspection general.	Yes; within the scavengers' limits; vaults cost from \$1.00 to \$2.50; dry earth closets cost from 12 $\frac{1}{2}$ c. to 25c. each; muddy garbage usually 12 $\frac{1}{2}$ c.; dry earth closets and garbage per annum, \$2.50; manure, 25c. per cubic yard.	Yes; from 25 to 30 per cent.	None, except gas works.	One; a butcher for feeding raw offal and for polluting creek; fined \$5.00 and costs.
Three; not licensed; boiled; no.	No; night soil removed regularly at cost of householder	No	Three slaughterhouses; one gas mfg. co.	Yes; one for using slaughterhouse contrary to Public Health Act.
None; all outside the limits; only of carcasses brought in the market for sale.	Yes; a charge of 50c. per bbl. of 45 gallons on number of bbls. removed.	Yes; about 33 $\frac{1}{3}$ per cent.	Two tanneries; one gas mfg. co.	No.
Two; no; boiled; no.	Yes; Pits, \$2.00, boxes, \$3.00, per year.	No	None	No.

TOWNS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board.	Contagious disease.
Barrie.....	L. Oliver, M. D.; E. Donnell.	Yes; no; action taken when complaints are made or through observation.	Diphtheria, 1 case; typhoid, 2 cases, 2 deaths; tuberculosis, 11 cases, 11 deaths.
Collingwood.....	A. R. Stephen, M.D.; Jno. Hogg.	Yes, by sanitary inspector and M. H. O.	Scarlatina, 6 cases; diphtheria, 5 cases; tuberculosis 7 cases, 7 deaths
Clinton	J. W. Shaw, M.D.; Wm. Coats.	Yes; repeated also	Scarlatina, 75 cases; diphtheria, 1 case; typhoid, 2 cases; tuberculosis, about 10 cases, 4 deaths.
Cobourg.....	R. E. McNicholl, M.D.; D. H. Minaker.	Regular sanitary inspection once a year.	Smallpox, 1 case; scarlatina, 9 cases, 1 death; diphtheria, 4 cases, 1 death; typhoid, 8 cases; tuberculosis, 4 cases, 4 deaths.
Cornwall	Chas. J. Hamilton, M.D.; Geo. S. Jarvis.	Yes, at intervals	Scarlatina, 25 cases; diphtheria, 10 cases, 1 death; typhoid, 20 cases, 3 deaths; tuberculosis, 7 cases, 7 deaths.
Campbellford ..	No M. H. O.; John Graham.	Yes, twice a year.	Typhoid, 2 cases; tuberculosis, 4 cases, 4 deaths.
Dresden	D. Galbraith, M.D.; Arthur Smith.	Yes; no	Scarlatina, 3 cases, 1 death; typhoid, 2 cases.
Dundas	T. A. Bertram, M.D.; Jas. More.	As a general rule action is taken when complaints are made.	.....
Essex	J. W. Brien, M.D.; John Walters.	General inspection repeated at intervals.	Scarlatina, 3 cases; diphtheria, 4 cases, 1 death; typhoid, 12 cases, 1 death; tuberculosis, 1 case.

TOWNS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; houses placarded and closely guarded; no isolation hospital.	No	Yes	No; no
Fairly.....	Occasionally.....	Yes.....	No.....
Yes, by placarding.....	Had only one case, it was used successfully.	In some cases.....	No; no
Patients are isolated in their homes and thorough disinfection carried out; no isolation hospital, the Board has a temporary one at present for small-pox patient.	It has been used 3 times in 5 cases successfully.	Yes, in every case	No.....
Yes.....	Yes; almost universally good.	Yes.....	Yes; no.....
No hospital.....	No diphtheria .....	.....	No.....
Yes, in their own homes; no isolation hospital.	Yes; results good	Yes	Yes; yes.....
No isolation hospital.....	Yes.	Under supervision of Health officer.	No; no.....
Yes, quarantine and placarding houses; no hospital.	Yes; favourable is the report from all physicians.	Yes.	Yes.....

TOWNS.—*Continued.*

Name of municipality.	Are forms for notification by teacher and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred? and state whether the tuberculin test has been used.
Barrie.....	No	Artesian wells	Yes; no.....
Collingwood.....	Yes.....	Waterworks.....	No; no; no.....
Clinton.....	Yes, to the principal...	All wells, ranging from 10 to 70 feet.	No; yes; tuberculin test used privately.
Cobourg.....	Yes.....	From waterworks, Lake Ontario.	Yearly inspection of dairies is made as regards cleanliness, stabling and feeding; no tuberculin tests made, nor has any cases of tuberculosis been reported.
Cornwall	Yes, by M. H. O.....	St Lawrence River.....	No; no.....
Campbellford	No.....	Wells, 24 ft.....	No dairy in municipality
Dresden.....	Yes.....	Wells, 15 to 20 ft	None in municipality; no.
Dundas	No.....	Four springs in connection with reservoir of town.	No inspection; no cases.
Essex	Yes	Artesian wells and water works system.	Yes; no tuberculosis, no test.

TOWNS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under the Public Health Act? State in detail the nature of the case, and results of same.
Three; no; offal boiled and fed to hogs.	Night soil removed; cost borne by householders; no systematic removal of garbage except in the spring.	Yes; between 4 and 5 miles on principal streets; fully $\frac{3}{4}$ of the houses on these streets have connection with the sewers.	None	No.
Three; no, fed to pigs; no.	Yes, 15c. per month.	No	None	No.
None, all outside of the town, no license.	Yes, done by private means.	No	None	No
Three; licensed and kept in good sanitary condition; offal is fed to hogs or buried.	No; the sanitary inspector orders all householders to remove all garbage and night soil at their own expense.	About 2 miles; public sewerage.	One establishment for storing and curing hides.	One prosecution; town and county council to abate a nuisance arising from drainage of county gaol.
Three; no license, but are inspected by M. H. O.; offal is buried; no.	Yes; each householder makes his own arrangements for removal and pays cost of same.	Yes, about one-third.	Manufacture of gas and storing of hides.	No.
None; no inspection of carcasses.	The matter is attended to by sanitary officers at cost of occupant.	No	None	No.
None; no.....	Removed by householder at their own cost.	No	None	No.
None; no inspection of carcasses.	Removed by householder; sanitary inspector looks after it and sees that the law is complied with.	No	Two tanneries	No.
None	Yes; each householder pays for his own.	No	None	No.

TOWNS.—Continued.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Forest	Walter Boyd, M.D.; W. G. Owens.	Yes, once a year and upon complaint.	Scarlatina, 21 cases, 1 death.
Goderich	Wm. J. C. Holmes, M.D.; Wm. Mitchell.	.....	Scarlatina, 9 cases, 2 deaths; typhoid, 11 cases; tuberculosis, 2 deaths.
Gore Bay.	J. Johnston, M. B.; John S. Hawkins.	Action taken upon complaint to Board.	None.....
Gravenhurst.....	A. P. Cornell, M.D.; H. Oaten.	Yes; yes, and action taken on complaint.	Tuberculosis, 1 death....
Galt	J. S. Wardlaw, M.D.; Adam Kay.	Yes; yes	Diphtheria, 54 cases, 1 death; typhoid, 56 cases, 2 deaths; tuberculosis, not reported till after death.
Glencoe.	J. Y. McLachlin, M.D.; G. M. Harrison.	Yes; yes	Typhoid, 2 cases reported
Harriston	W. A. Harvey, M.D.; A. A. Stewart.	General inspection early in the spring.	Diphtheria, 3 cases, 1 death; tuberculosis, 1 death.
Huntsville	F. L. Howland, M.D.; John Hoile.	Yes, and action is taken when complaint is made.	None.
Kincardine	N. Hopkins, M.D.; J. H. Scougall.	General sanitary inspection and repeated at intervals.	Scarlatina, 12 cases; diphtheria, 7 cases, 1 death; typhoid, 7 cases.
Leamington	G. C. Moxon, M.D.; Wm. Coultis.	Only when complaint is made.	Scarlatina, 2 cases; diphtheria, 10 cases, 2 deaths; typhoid, 2 cases.
Listowel	L. W. Thompson, M.D.; W. E. Binning.	Yes; Yes	Scarlatina, 30 cases, 1 death; diphtheria, 13 cases, 2 deaths; typhoid, 14 cases; tuberculosis, 7 cases, 7 deaths.

TOWNS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public school? Does it require a certificate of vaccination from new school children each year?
Yes, by placarding houses where cases exist.	Think so	Yes, except when proper disinfection is certified to by attending physician.	Yes; no.....
No; no.....	None used this year.....	No	No; no
Yes, isolate and disinfect; no hospital.	Have not had any cases of diphtheria for 5 years.	Yes	No.....
No, as regards consumption.	No; no occasion.....	No.....	No; no
Yes, patient isolated and quarantine established; no.	Yes; excellent, only 1 death out of 54 cases, and in this case the patient had been ill 3 or 4 days before attended to.	Yes.....	Yes; no.....
No hospital; houses placarded.	Yes; successfully used....	Yes, by attending physician.	No.....
Yes.....	Yes; when administered early.	Don't know	Yes.....
.....	Yes; successful	Yes, by Inspector	Not this year
The family confined to house; house placarded; no hospital.	.....	Under personal supervision of Sanitary Inspector.	No certificate of vaccination required.
Houses are isolated as much as possible and placarded; no hospital.	Yes; results very satisfactory.	Yes, or by attending physician.	No; no
Yes; houses placarded and inmates quarantined.	Yes; results good	No.....	No; no

TOWNS.—Continued

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises? If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Forest.....	No.....	Wells, 20 feet.....	No
Goderich	No.....	Lake Huron.....	No ; no ; no.....
Gore Bay.....	No.....	Principally springs, carried through galvanized pipes.	No....
Gravenhurst.....	Yes	Wells, 25 ft. deep.....	No ; no.....
Galt	Yes	Waterworks system and wells.	Yes ; no
Glencoe	Ye	Wells, from 15 to 20 ft ..	No.....
Harriston	Yes.....	Wells, 16 to 24 ft	No.....
Huntsville.....	No.....	Waterworks and wells ..	No dairies.....
Kincardine	No.....	Lake	No drainage in the municipality.
Leamington	No.....	From water works ; a few wells ; about 11 ft.	No ; o
Listowel	No.	Principally wells	No ; no

TOWNS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, and results of same.
None	Yes; costs charged against property, 75c. per. bbl.	Yes; on parts of King and Main streets.	None	No.
None; no, fed to hogs; no.	No	Yes, 10 per cent....	None	One; a doctor for failure to report a case of scarlet fever; nominal fine.
Three; no license; fed to pigs.	No	No	None	No.
None within municipality.	Removal is done by occupant of property, and payment is made by agreement.	No	None	No.
None; yes, slaughter houses are in tp. of Dumfries and are inspected.	Yes; so much per yard for pits, earth closets and garbage extra.	Partially	Two tanneries, one gas house; inspected regularly.	One; fined \$2.00 and costs.
None; no.....	Yes; night soil removed at a cost of 24c. per barrel.	No	None.....	No.
None	No	No	None.....	No.
None	None.....	None.....	None.....	No.
Two slaughter houses; inspected by sanitary inspector.	Yes; householder pays the cost.	No.....	None.....	No.
Two; yes; offal buried; no inspection of carcasses.	No; removed by householders.	No.....	None.....	No.
None	No; by householder.	No.....	No.....	No.

TOWNS.—*Continued.*

Name of Municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases
Mount Forest	No M. H. O.; W. C. Perry.	Yes; by Inspector, approved of by Council; one general inspection in the spring and when complaint is made.	Scarlatina, 2 cases; diphtheria, 2 cases; typhoid, 4 cases, 1 death; tuberculosis, 1 case, 1 death.
Meaford.....	J. G. Clark, M.D.; G. G. Albery.	No general system; action only taken when complaint is made.	Typhoid, 2 cases.....
Mattawa	M. James, M.D.; A. Ridout.	Yes; yes	Scarlatina, 4 cases; diphtheria, 6 cases.
North Toronto.....	S. R. Richardson, M.D.; W. J. Douglas.	Once each year	Scarlatina, 5 cases; diphtheria, 1 case, 1 death.
Napanee	No M.H.O.; J. E. Her-ring.	Yes; action taken when complaint is made.	Scarlatina, 3 cases; typhoid, 2 cases.
Niagara Falls	— Burger, M.D.; W. H. Day.	Sanitary Inspector on duty at all times.	Typhoid, 1 case, 1 death; tuberculosis, 5 cases, 5 deaths.
North Bay	J. W. Carruthers, M.D.; M. W. Flannery.	Only when complaint is made to Board.	Tuberculosis, 6 deaths ..

TOWNS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
In the hands of the medical practitioner, who exercises great care.	.....	No.....	No.....
The attending physicians insist on isolation of the patients in their houses so far as practicable; no isolation hospital.	No.....	No, there has been no general epidemic.	No.....
Yes	Yes; results good	Yes	No; no
Isolation in the house.....	No.....	Only when considered necessary by M.H.O.	Not usually; the Board does not require a certificate of vaccination.
Yes; no hospital	Yes	Carried out by physician in attendance.	No; no
Isolated in the house from other members of family; no hospital.	No.....	By M.H.O.; formaldehyde is used.	No; no
Yes; residence of families are quarantined.	Yes; satisfactory	Yes	No

TOWNS.—Continued.

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Mount Forest	Yes	Are putting in water works system; source of supply from wells; 500 ft. deep, about 400 ft. through a rock.	No.....
Meaford.....	No; yes; semi-annually.	Georgian Bay	No.....
Mattawa	No.....	Wells; and Mattawa river	No.....
North Toronto	Yes.....	Wells are used where the town water main is not laid; depth from 15 to 80 ft.	No.....
Napanee	Yes.....	Wells; 12 to 15 ft. deep.	No.....
Niagara Falls	Yes.....	Niagara river and a few wells.	Yes; yes; 5 cases of tuberculosis, 3 killed and 2 isolated and quarantined.
North Bay	Yes.....	Lake Nipissing	No.....

TOWNS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
One; no license; inspector visits frequently; all animal-inspected before being slaughtered by a town inspector.	No.....	No.....	None.....	No.
One; no system for disposal of offal; no system of regular inspection.	No systematic removal of garbage; on complaint being made of any unsanitary conditions the Board requires removal of filth, etc., from the premises.	No.....	Two tanneries; not licensed; 1 slaughter house.	No.
None.....	Yes.....	No.....	None.....	None.
Five; permits issued by Board of Health; no inspection made.	Garbage and night soil is in most cases disposed of on premises; we have one excavator who is employed by some parties at 30c. per load for removing night soil.	No.....	Five slaughter houses; licensed.	No.
Two; at extreme limits of municipality; inspected regularly; no.	No; except by carts.	A few blocks only: stone drains mainly.	Bone boiling, 1; storing of hides, 1; soap factory, 1; tallow melting, 1; mnfg. of gas, 1.	No.
None.....	Yes; garbage and ashes, 1 wagon load, 50c; night soil, 3 in family, 15c; removal monthly: 4 to 7 in family, 20c; 8 to 12, 25c; 10 and over 40c.	Yes; about seventy per cent.	Storing of hides; not licensed.	N
None.....	Yes; night soil is removed twice a year; each rate-payer pays cost of removal.	No.....	No.....	No.

TOWNS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases
Ottawa, E.	Geo. Baptie, M.D.; W. M. Barry.	Yes, in May; also when complaint is made.	Scarlatina, 1 case.
Oakville.....	J. S. Williams, M.D.; W. S. Davis.	Inspected at intervals and when Board think it necessary.	None
Owen Sound.....	Allan Cameron, MD.; Thos. Gordon.	Yes; yes; action taken as well when complaint of nuisance is made to Board.	Scarlatina, 5 cases, 1 death; diphtheria, 1 case; typhoid, 16 cases, 2 deaths
Oshawa	No M.H.O.; Thos. Morris.	Annually and when complaints are made.	Scarlatina, 16 cases; diphtheria, 16 cases, 4 deaths; typhoid, 4 cases, 2 deaths; tuberculosis, 4 deaths.
Orangeville.....	A. J. Hunter, M.D.; A. A. Hughson.	Yes; also on complaints.	Scarlatina, 1 case; typhoid, 1 case.
Pembroke	W. W. Dickson, M.D.; A. J. Fortier.	General supervision by sanitary inspector; special action when complaints are made.	Scarlatina, several cases; typhoid, 22 cases; tuberculosis, 12 deaths.
Prescott.....	W. P. Buckley, M.D.; J. B. White.	Yes; and repeated on complaint.	.....
Paris.....	D. Dunton, M.D.; S. Dodson.	One general inspection and at other times when M.H.O. considers it necessary.	Scarlatina, 6 cases; diphtheria, 8 cases; typhoid, 2 cases; tuberculosis, 2 deaths.

TOWNS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes, as far as is known, when the size of the house and family admit of it; sometimes removed to county hospital; no isolation hospital but there are two in adjoining city.	Yes	No; no; yes	No; no
Yes; no hospital.	No.....	Yes.....	No; no
As far as possible; separation with wet sheet over the doorway and the free use of various disinfectants in solution or as vapor; no isolation hospital.	No; has been used in one case with satisfactory result.	In all cases	No; no
Yes; house placarded; no hospital.	Some physicians use it with good results.	No; under supervision of M. H. O.	No
Yes	Kept on hand	Yes.....	Yes; no
Yes; no isolation hospital; contagious diseases are isolated in the house; children if any attending school are removed to other houses, or failing that are kept from school; precautions to prevent communication with affected persons are taken; free use of disinfecting liquid.	Yes; all the physicians in town use anti-toxine and all report satisfactory results when used early in the disease; also marked benefit in many cases when the disease had existed for 3 or 4 days.	No; physicians are impressed with the necessity of seeing disinfection carried out; sanitary inspector or M. H. O. keep a general oversight when they suspect that proper precautions are not carried out.	Schools inspected by M. H. O. and sanitary inspector; no certificate of vaccination has heretofore been insisted upon.
No; when cases of diphtheria or small-pox it is carried out.	Yes; cannot give results..	Yes	No.....
Yes; houses placarded and inmates not allowed to mingle with the public.	Yes; cannot give details; 7 or eight children were treated with anti-toxine with 2 deaths 8 children were immunized none of which took diphtheria.	Yes; under instructions of M. H. O.	Yes yes.....

TOWNS.—Continued.

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Ottawa, E.	No.	Wells; about 12 ft.	No; no cases occurred; yes; the test has been made.
Oakville.	No.	Wells; about 20 ft.	No; no.
Owen Sound.	Yes.	Mostly town system of water works; the usual depth of wells is about 16 ft.	No; 2 cases of tuberculosis.
Oshawa.	To physicians only.	Wells; 15 to 30 ft.	Yes; veterinary has inspected some herds; no cases.
Orangeville.	No.	Water works system.	No.
Pembroke.	Yes.	From water system of town; taken from the Ottawa river.	No; the majority of dairy men had their cows tested a year ago, with negative results.
Prescott.	No.	Wells.	No.
Paris.	Yes; yes. ....	.....	No animal inspection; no cases of tuberculosis; tuberculin test has been used.

TOWNS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
Two; in good sanitary condition; offal buried; no inspection of carcasses.	No.....	No.....	Two; butchers	No.
Three; not licensed; fairly good condition; boiled and fed to hogs; no.	No.....	No.....	No.....	No.
One; yes; as a rule it is boiled and fed to pigs; no systematic inspection of carcasses.	No.....	Yes.....	Storing of hides, soap boiling, tallow melting, slaughtering animals, mnfg. of gas.	No.
One; inspected; offal is fed to pigs.	Dry earth system is used; yes.	Not a complete system.	.....	None.
None; no; no...	By householder; no contract.	No.....	None.....	No.
None; sanitary inspector keeps under observation all carcasses exposed on market.	Proprietors are requested to keep the premises free from garbage; night soil removed at intervals; no systematic removal.	No general sewage system.	None	One prosecution for refusal to clean privy pits.
None	No	No	None	No.
None	Yes; night soil costs 15c monthly for 2 earth closets and \$2.50 for pits of 2 cubic yds.; over 2 cubic yds. \$1.50 per yd.; garbage removed by contract.	No	None	No.

TOWNS.—*Continued.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Preston	N. Malloy, M.D.; M. H. Husband.	Yes; annually and when complaint of nuisance is made.	Scarlatina, 8 cases; diphtheria, 1 case; tuberculosis, 2 cases.
Palmerston.....	A. Greenlaw, M.D.; S. Caswell.	Yes; and on complaint being made.	None
Penetanguishene.....	Geo. Bowman, M. D.; W. H. Hewson.	Yes; yes.....	Diphtheria, 2 cases; tuberculosis. 1 case.
Perth	No M.H.O.; John A. Kerr.	Sanitary inspector makes a general inspection.	Tuberculosis, 7 deaths...
Port Hope	L. B. Powers, M.D; J. W. Sanders.	.....	Scarlatina, 12 cases, 1 death; typhoid, 5 cases, 2 deaths; tuberculosis, 2 deaths.
Port Arthur.....	G. S. Beck, M.D.; Jas. McTeigue.	Yes; yes.....	Scarlatina, 10 cases; diphtheria, 5 cases, 1 death; tuberculosis, 4 cases, 4 deaths.
Ridgetown	M. T. McFarlane, M.D.; D. Cochrane.	Back yards inspected yearly.	None
Renfrew	N. McCormack, M.D.; J. K. Rochester.	Yes; yes; no .....	.....
Simcoe	J. C. C. Grasett, M.D.; W. C. McCall.	Yes; general inspection every spring by sanitary inspector and M. H.O. and upon complaint of all nuisances.	Scarlatina, 12 cases; diphtheria, 4 cases, 1 death; typhoid, 1 case; tuberculosis, 2 deaths.

TOWNS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists	Is diphtheria anti-toxine in common use by physicians? Give result, of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the general supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
So far as possible, in their own homes; no.	Not generally used as yet.	Not done systematically but will be hereafter; Schering's disinfectant and tablets are used.	Yes; no.....
No.....	Don't think so.....	No.....	No.....
Yes.....	No.....	Yes.....	Yes.....
Yes; houses placarded....	No cases of diphtheria in town.	Under supervision of sanitary inspector.	No; no.....
Yes; placarding and supervision of sanitary inspector.	No cases.....	Yes.....	No.....
Yes; isolation at home and quarantine; no hospital	Yes; excellent results; rapid recovery.	Yes; Under supervision of health inspector.	Yes; no.....
No hospital.....	Anti-toxine is and will be used by all physicians here.	No; by attending physician.	No.....
Yes; isolation in private houses.	Yes; very satisfactory...	No.....	No; no.....
Yes; house placarded; inmates quarantined; no hospital.	Yes; used in two cases, one proved fatal; administration was at a late stage.	Yes.....	Yes; no.....

TOWNS.—Continued.

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Preston	No	Artesian wells and springs.	Yes; no
Palmerston	Don't know	Wells; average 12 feet.	No inspection
Penetanguishene	Yes	Waterworks.....	No
Perth	Used by Board	Wells; average about 14 feet.	No
Port Hope	Yes	Waterworks system by sand filtration from lake and wells.	No
Port Arthur.....	No	Creeks	Yes; once a week by health inspector; no cases.
Ridgetown	Yes	Wells; from 10 to 25 feet.	None
Renfrew	Yes	Waterworks and wells ..	Yes; no tuberculosis occurred.
Simcoe	Yes	Wells; 16 to 20 feet	No

TOWNS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage, and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under the Public Health Act? State in detail the nature of the case, and results of same.
None	Yes; once a year and when deemed necessary; by householders.	No	No	No.
None	By householders....	No	None	No.
One; no license; no.	Not systematic	In part of town	None	No.
Three	Fairly systematic ..	No		No.
None	Yes	No; only partial....	Gas works.....	No.
Three; inspected weekly by M. H. O.; offal burned.	Yes; by tender....	Partial system.	None	No.
None; no inspection of carcasses.	Yes; scavengers remove night soil, householders pay cost.	No	None	No.
None	Yes; council grants \$500 to pay scavenger for removing all night soil, \$400 as salary and \$100 to buy lime, etc; the amount is raised as follows: \$250 from general town fund and the other \$250 is levied on ratepayers at a rate of 50c per family of 5 persons, and 25c per 5 persons over the first five.	Yes; 15 per cent ..	Two tanneries	No.
None	Yes; removal is made at cost of owner or tenant.	No	None	No.

TOWNS.—Continued.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Smiths Falls	C. L. Easton, M.D.; B. E. Sparham.	Yes; yes at intervals....	Scarlatina, 10 cases, 3 deaths; diphtheria, 5 cases; tuberculosis, 8 cases, 6 deaths.
Sault Ste. Marie	No M.H.O.; J. Basingthwaighe.	Inspection by sanitary inspector.	Scarlatina, 2 cases; typhoid, 53 cases; tuberculosis, 8 cases, 4 deaths.
Sandwich	H. R. Casgrain, M.D.; C. H. Ashdown.	Yes; when necessary....	None for 1898
Seaforth.	Chas. McKay, M.D.; W. Elliot.	General sanitary inspection at least once a year.	Diphtheria, 4 cases, 1 death; typhoid, 2 cases.
Toronto Junction.....	A. C. Maverty, M.D.; W. J. Conron.	Yes; yes.....	Scarlatina, 38 cases, 2 deaths; diphtheria, 14 cases.
Thorold	R. J. Johnston, M.D.; W. T. Fish.	Yes; action when complaint is made.	Scarlatina, 7 cases; typhoid, several cases.
Teeswater	D. Stewart, M.D.; J. Farquharson.	Sanitary inspection twice a year.	Tuberculosis, 1 case.....
Thessalon	T. J. McCort, M.D.; S. Hagan.	When complaint is made.	.....
Tilsonburg	C. McDonald, M.D.; A. Raynes.	General sanitary inspection twice a year.	Typhoid, 3 cases
Uxbridge	H. Bascom, M.D.; A. D. Williams.	General inspection in spring, action afterwards on complaint.	Scarlatina, 35 cases; diphtheria, 2 cases; typhoid, 27 cases, 4 deaths; tuberculosis, 1 case.

TOWNS.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxin in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board.	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; house placarded; no hospital.	Yes	Yes	Schools inspected.....
Yes; by isolation; no hospital.	Yes; not necessary this year.	Not always, as the Board cannot induce the council to appoint a M.H.O.	No.....
Has not been necessary ...	No occasion	Not necessary	Yes
Kept isolated in a room; no hospital.	Yes; no deaths occurred where used.	No; attendant physician gives the directions.	No; no
Yes; isolated in separate room with nurse; no hospital.	Yes; satisfactory results; one patient died but was in a comatose condition when administered.	Only 1 case.....	Yes; no.....
Yes.....	No cases	Yes	No.....
Yes; house placarded and inmates not permitted to leave the house.	Yes	Yes	Yes; no.....
.....	No.....	Yes	No.....
Yes; by placards	Yes; excellent.....	Yes; Formaldehyde regulator kept ready for use.	No.....
Isolation not as systematic as desirable.	Have had very little diphtheria for years; no anti-toxine as yet.	No.....	Yes; no

TOWNS.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the sources of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Smiths Falls	Yes; to M.H.O.	Wells; 30 feet.	No
Sault Ste. Marie.....	No	Lake Superior and river; some few wells are used.	No
Sandwich	No	Water supply is from Windsor and wells.	No
Seaforth	No	Wells	No; no
Toronto Junction.....	No; yes	Lake Ontario ...	No; 1 case; no.....
Thorold	No	Wells; 25 to 35 feet ...	No
Teeswater	Yes	Wells; from 20 to 50 feet.	Yes; no cases of tuberculosis.
Thessalon	No	Lake Huron	No
Tilsonburg	Yes	Spring water and wells; 10 to 12 feet.	No
Uxbridge	Yes	Wells; 10 to 12 feet ...	No

TOWNS.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to which is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
None	Yes; 50c per bbl....	Only partial	Two tanneries.....	No.
One; not licensed but inspected; no inspection of carcasses.	Not quite systematic; each occupant looks after his own; have 3 scavengers in town and any one can engage them if they wish.	Not a system; about half of the residents use the sewer	None	No.
None	Night soil is buried; garbage burnt.	Partial; about 15 per cent.	None	No.
None	No system	No	None	No.
One; not on a large scale; carted to the crematory; no.	Yes	30 per cent	None	No
None	Done by house holders.	No	None	No.
None	Householder is instructed to have garbage and night soil removed, the Board of Health supplies a waggon for the purpose.	No	None	No.
Three; fed to hogs; no.	No; householders look after this.	No	None	No.
Three; inspected; no license; offal carried away by farmers; no.	Yes; 20c each house per month.	No	None	No.
One; yes; fed to hogs.	No	No	None	No.

TOWNS.—*Concluded.*

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Vankleek Hill.....	H. D. McKinnon, M.D.; F. W. Thistlewhaite.	Yes; general sanitary inspection every spring repeated when complaints are made.	Typhoid, 1 case, 1 death; tuberculosis, 3 cases, 3 deaths.
Wingham ..	W. B. Fowler, M.D.; J. B. Ferguson.	Action taken when complaint is made to Board by sanitary inspector or others.	Tuberculosis, 2 cases, 2 deaths.
Whitby	D. P. Bogart, M. D.; Joseph White.	When complaints are made.	Scarlatina, 2 cases; diphtheria, 1 case; tuberculosis, 1 case, 1 death.
Walkerton	G. J. Dickison, M.D.; W. S. Gould.	Yes; yes; and action taken when complaint is made.	Scarlatina, 1 case; diphtheria, 3 cases; typhoid, a few cases; tuberculosis, 3 deaths.
Warton	H. Wigle, M.D.; D. J. Ferguson.	Yes; yes.....	Typhoid, 3 cases, 2 deaths
Woodstock	A. T. Rice, M.D.; John Morrison.	Continuous inspection made by sanitary inspector who reports to the Board.	Scarlatina, 2 cases; typhoid, 20 cases.
Walkerville	C. W. Hoare, M.D.; C. H. Robinson.	Yes; once a year, and further action taken when complaint is made.	Scarlatina, 3 cases; diphtheria, 5 cases.

TOWNS.—*Concluded.*

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxin in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; houses placarded and quarantined; no hospital.	Yes; results most satisfactory.	Yes	Yes; no
Not systematically; but patient generally isolated	No diphtheria here for years.	Yes	No; no
House isolation	No	Yes	Yes
Yes; as well as can be done in home of patients; patients kept isolated; house placarded; no hospital.	Yes; to a certain extent..	Yes	No; no
Yes; no hospital; house isolation.	Yes; favorable	Yes	Yes; once a year; no...
Yes; houses placarded; no.	Yes; results good ...	Yes	Yes; yes
Yes; house placarded and inmates quarantined; no hospital.	Yes	Yes	Yes; a resolution passed to this effect but school board absolutely refused to enforce it.

TOWNS.—*Concluded.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the sources of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows in the town during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Vankleek Hill.....	Yes	Wells; from 18 to 25 feet.	No; tests have been made, but tuberculosis occurred.
Wingham	Yes	Wells; 12 to 35 feet.....	No
Whitby	Yes	Wells; from 12 to 30 feet.	None
Walkerton	Yes	Springs giving abundance of water.	Not by a veterinary surgeon; the sanitary inspector looks after the dairies and condition of cows; no tests; no cases
Wiarton	Yes	Waterworks system; water from Georgian bay.	No; no
Woodstock	Yes	A general distribution of water drawn from outside sources; quality first class; some use wells.	Yes; no; no
Walkerville	Yes	Detroit river	Only a sanitary inspection.

TOWNS.—*Concluded.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made? How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses to whole is connected with public sewers?	State No. and kind of noxious trades. (See sec. 63, Public Health Act.) How licensed and regulated?	Have there been any prosecutions during year under Public Health Act? State in detail the nature of the case, and results of same.
None	No	No	None	No.
None	No	No	None	No.
Two; no; boiled; no; inspected at intervals.	No	No	None	No.
Three; yes; boiled and fed to hogs; no systematic inspection of carcasses.	Only by private contract with householder.	Yes	None	No.
None	Not garbage	No	None	No.
Four; yes; fed to hogs; yes.	Yes; done by unlicensed parties at 25c per month.	Only partial; half or two-thirds.	None	No.
One; not licensed; offal cooked and fed to hogs.	Yes	Yes; very few houses unconnected.	None	No.

CITIES.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Belleville.....	R. Tracey, M.D.; D. B. Robertson.		Scarlatina, 17 cases, 2 deaths; diphtheria, 10 cases; typhoid, 14 cases, 4 deaths; consumption, 11 cases, 11 deaths.
Brantford	F. G. E. Pearson, M.D.; H. F. Leonard.	Yes; yes, also when complaint is made.	Scarlatina, 44 cases; diphtheria, 32 cases, 3 deaths; typhoid, 44 cases, 7 deaths; tuberculosis, 16 deaths.
Chatham	Wm. R. Hall, M.D.; Wm. G. Merritt.	Yes; yes	Scarlatina, 9 cases; diphtheria, 29 cases, 1 death; typhoid, 61 cases, 1 death; tuberculosis, 9 deaths.
Kingston	S. H. Fee, M.D.; W. M. Drennan	Yes; yes	Scarlatina, 2 cases; diphtheria, 22 cases, 1 death; typhoid, 8 cases, 4 deaths; tuberculosis, 32 deaths November 10th.
Hamilton	Isaac Ryall, M.D.; Thos. Beasley.	Inspections are always going on; in summer a general inspection.	Scarlet fever, 214 cases, 10 deaths; diphtheria, 162 cases, 20 deaths; typhoid, 37 cases, 6 deaths.

CITIES.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes, placarding and isolation hospital.	Yes	Yes, thoroughly	No; no
Yes, as well as possible, at houses; placarded in scarlet fever and diphtheria cases.	Yes; results good in most cases.	Disinfection is carried out as far as possible under direction of sanitary inspector.	Schools are visited by M.H.O. and sanitary inspector.
Yes; have two isolation hospitals, nearly all city cases are sent there; when this is not done we isolate them at their homes.	Yes; results are very satisfactory; its use is approved of by all members of the profession and is popular with the public.	Yes	No; no
Yes, by physician in charge by placarding the house; yes.	Yes; results are satisfactory.	No; but the M. H. O. makes due enquiries of the proper disinfection of the houses.	No; no
No; it is when practicable, difficult to carry out in many cases.	Can't say, have no faith in it; patients die after its use.	Yes, lately	Have written all heads of schools recommending that no children be received into school without certificate of vaccination from their family physician.

CITIES.—*Continued.*

Name of municipality.	Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum.	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Belleville	Yes	Waterworks and wells, 20 to 30 feet deep.	No
Brantford	Yes	About two-thirds use the city supply and one-third from wells 12 to 50 feet.	Yes; no cases of tuberculosis has been reported; tuberculin test will be applied to all dairies.
Chatham	Yes	City supplies filtered water from River Thames to over half the householders, the remainder use wells; depth, 16 feet.	Yes; tuberculin test used; in one herd only one animal showed reaction, in another herd 3 cows did not stand the test and were destroyed.
Kingston	Yes	Lake Ontario	Yes; no; yes
Hamilton	Supplied to physicians only.	City waterworks supply water from Lake Ontario.	Yes; I look upon the tuberculin test as unsatisfactory; "it's a fad which will die in time."

CITIES.—Continued.

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by any officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what proportion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63. Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
None	Yes	Partially so	One tallow and hide storehouse.	Yes.
3 small ones outside city limits; offal is covered with earth and carted away.	No systematic garbage system; night soil is removed by contract, costing 15c. per month and collected by contractor.	Yes; about 775 connections.	Soap works and varnish factory.	A few minor cases.
None in the municipality, those in immediate vicinity are inspected; offal is cooked and fed to hogs; no systematic inspection of carcasses, but inspector does some inspection on market days.	There is of night soil but not of garbage; 20c. per cubic foot is paid for the first 40 feet, over that 10c. per cubic foot.	Yes; don't know, but 12,600 feet of new sewers were constructed this year.	None	No.
Two; no; no.....	Yes; night soil at \$2.50 per cubic yd., garbage 10c. for 24 gals.	Yes; don't know ...	Hide storing, 2; tallow melting, 1; slaughtering of animals, 2; gas mnfg. 1; not licensed.	No.
2 slaughter houses of hogs, 1 of cattle and sheep, each permitted but not licensed; offal and blood sent to fertilizing works; carcasses superficially inspected.	Garbage removed from each house weekly by scavengers employed by the Board of Health; night soil removed from privy vaults when notified by inspector, by men holding certificates from Board of Health; dry earth closets cleaned monthly, cost 25c per month; scavengers paid \$4.50 per day, amounting to \$616.00 annually; removal of night soil costs \$1.25 per cubic yd.	Public sewers; about 90% of houses are connected.	One fertilizing establishment, which includes blood boiling, bone boiling and slaughtering of horses; gas mnfg., five hide storing houses; permitted but not licensed.	No.

CITIES.—Continued.

Name of municipality.	Names of Medical Health Officer and Secretary of Board.	Is there general sanitary inspection? Is it repeated at intervals every year? or is action taken only when complaint of nuisance is made to Board?	Contagious diseases.
Ottawa	A. Robillard, M.D.; John Camthray.	Inspection of premises twice a year by assistant inspectors and sanitary police detailed for the purpose.	Scarlatina, 48 cases, 4 deaths; diphtheria, 150 cases, 24 deaths; typhoid, 147 cases, 17 deaths; tuberculosis not reported.
Stratford	J. T. Robertson, M.D., R. R. Lang.	Yes	Scarlatina, 17 cases, 2 deaths; diphtheria, 32 cases, 4 deaths; typhoid, 18 cases, 2 deaths; tuberculosis, 14 deaths.
St. Catharines	J. Rollinson, Secy.; A. Boulden, S. I.; and M. H. O.	Yes; general sanitary inspection and is repeated twice every year.	Scarlatina, 41 cases, 1 death; diphtheria, 4 cases, 1 death; typhoid, 4 cases, 4 deaths; tuberculosis, 17 cases, 17 deaths.
St. Thomas	W. C. Vanbuskirk, M.D.; W. B. Doherty.	Complaints are attended to when made.	Scarlatina, 24 cases, 1 death; diphtheria, 37 cases, 2 deaths; typhoid, 4 cases, 2 deaths; tuberculosis, 14 deaths.
Toronto	Charles Sheard, M.D.; John Blevins.	General house to house inspection once a year, also inspection of complaints as received.	Scarlatina, 628 cases, 17 deaths; diphtheria, 474 cases, 60 deaths; typhoid, 157 cases, 36 deaths.
Windsor	R. Carney, M.D.; S. Lusted.	Sanitary inspection is constantly being made by inspector.	Diphtheria, 5 cases; typhoid, 2 cases, 1 death; tuberculosis, 8 cases.

CITIES.—Continued.

Is isolation of contagious diseases systematically carried out? State methods adopted and whether any isolation hospital exists.	Is diphtheria anti-toxine in common use by physicians? Give results of treatment in all cases where possible.	Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	Does the Board make systematic inspection of the public schools? Does it require a certificate of vaccination from new school children each year?
Yes; in two isolation hospitals for the purpose.	Yes, as a rule, and with very fair success when cases are seen in time.	Yes	No; no
Yes	Yes; results good.	Yes .....	.....
Yes; by placarding house and removal to isolation hospital.	Anti-toxine has been used in a few cases, but successfully.	Yes, by the sanitary inspector.	Compulsory vaccination when deemed necessary
Yes; patients, attendants and all persons who have access to sick room are quarantined for 21 days or more; isolation hospital for smallpox only.	Yes, by almost all physicians in the city; of the cases treated early with anti-toxine not one resulted fatally. Several cases of diphtheritic croup were treated with it and all of them recovered.	Sanitary inspector instructs householders according to rules in Pamphlet No. 1, 1893, issued by Provincial Board.	The Board does not make any inspection of schools; certificate of vaccination is not required.
Yes; quarantine of uninfected inmates of house, daily visit of quarantine officers, houses placarded and funerals prohibited; yes.	Yes	Yes	Yes; yes.. ..
Isolation hospital for smallpox, other contagious diseases treated in the homes of patients.	Yes; results satisfactory..	Yes, by the inspector...	Yes; all the pupils not previously vaccinated are now being vaccinated.

CITIES.—*Concluded.*

Name of municipality.	Are forms for notification by teacher and M. H. O. of contagious diseases supplied?	Give the source of water supply used on the premises. If from wells, state usual depth of water bearing stratum,	Is there systematic inspection of dairy cows made during the year? Have cases of tuberculosis occurred, and state whether the tuberculin test has been used.
Ottawa	M. H. O. has forms to notify teachers.	Ottawa river; no wells..	Yes; cases of tuberculosis have occurred and tuberculin test applied. A certificate to the effect that such a test has been applied is a condition required before obtaining license of milk vendor.
Stratford			Yes
St. Catharines	Forms are supplied to teachers by the Board.	Waterworks and a few wells.	A monthly inspection of dairy cows is made; no cases of tuberculosis have occurred.
St. Thomas	No	Waterworks	No
Toronto	Yes	Lake Ontario	Yes
Windsor	Yes	Waterworks, water from Detroit river.	Yes

CITIES.—*Concluded.*

How many slaughter houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? How is offal disposed of? Is there systematic inspection of carcasses by an officer of the Board?	Is there systematic removal of garbage and night soil? If so, on what basis of cost is the removal made. How is cost calculated?	Is there a public sewerage system? If so, what portion of houses of whole is connected with public sewers?	State No. and kind of noxious trades. (See Sec. 63, Public Health Act). How licensed and regulated?	Have there been any prosecutions during the year under Public Health Act? State in detail the nature of the case, any results of same.
Not licensed slaughter houses in the city; no systematic inspection of carcasses.	Night soil is removed by contract to farm lands as well as animal and vegetable matter, such as market sweepings, manure and kitchen refuse, as fertilizers; in both cases the expense is paid by the person for whom the work is done.	Yes; about $\frac{1}{3}$ of the houses are connected with the sewers.	Hide inspection; storage of hides, soap boiling, gas mnfg., junk stores; licensed.	Some done by the sanitary inspector.
.....	Yes	Yes .....	.....	.....
3; no license; market inspector inspects all meat offered for sale.	Night soil and garbage are removed by the scavengers; cost 25c. per bbl.; paid by the householder.	Yes; the proportion of house connections is 10 to 100.	Tanneries, 3; soap factory, 1; storing of hides, 2.	No.
1, a pork packing establishment; offal is carried out of the city and used for fertilizing purposes; no systematic inspection of carcasses.	Yes; removed by persons who work on their own responsibility; cannot give cost.	Yes; about 20% connected.	1 slaughterhouse for hogs; 3 hide storehouses; 1 soap boiling; 1 gas mnfg.	One clergyman was brought before the magistrate for mingling with the public while his two children had diphtheria; magistrate decided that he did not violate the law; case dismissed.
33; regulated in accordance with sec. 9, Schedule A, P. H. Act; offal removed to outside of city by private parties.	Garbage removed twice a week by city scavengers; night soil removed by private contractors.	Yes .....	.....	(See page ---)
None	Removed by contract under supervision of inspector; costs \$2.50 to \$3; night soil is removed when required by approved appliances at the cost of householder of 25c. per bbl.	The principal streets are provided with sewers; I have no data as to connections, but is estimated by inspector that $\frac{2}{3}$ of the houses are connected.	None	3 prosecutions during the year; 2 for keeping a pig within 70 ft. of a house, and one of a junk dealer for keeping bones and rags, causing a nuisance.

Cases prosecuted in the police court for the year ending October 31st, 1898.

Full and foul privy pits	83	Dumping night soil in River Don	4
Establishing new privy pits	4	Offering diseased animal for sale	1
Defective plumbing and drainage	27	For not reporting a case of contagious disease ..	1
Foul cellars	14	Breach of plumbing by-law	20
Filthy yards	3	“ ice regulations	6
Filthy premises	10	“ quarantine regulations	2
Foul water on lots	2	“ “ Act to regulate Maternity Boarding	
Foul wells	1	Houses”	1
Burying contents of privies in yards	2	Breach of “ Act for the Protection of Infant	
Dumping night soil on lot	1	Children”	2
Number of summonses issued			113
“ cases in court Nov. 1st, 1897			2
“ cases withdrawn			78
“ cases dismissed			7
“ cases fined			24
“ cases remanded for sentence			4
“ cases still in court (October 31st, 1898)			2

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Summary of fines imposed.

Nature of offence.	No. of fines.	Amount of fines.
For burying contents of privy pits in yards	1	\$ 5 00 and costs or 10 days.
“ dumping night soil in River Don	4	20 00 “ 14 “
“ defective drainage and foul privy pit	1	5 00 “ 14 “
“ filthy yard and stable	1	5 00 “ 14 “
“ neglecting to report a case of contagious disease	1	1 00 “ 14 “
“ breach of ice regulations	3	20 00 “ 14 “
“ “ quarantine regulations	2	11 00 “ 14 “
“ “ plumbing by-law	10	30 00 “ 14 “
“ “ “ Act for Protection of Infant Children ”	1	20 00 “ 6 m'ths.
“ “ “ Act to regulate Maternity Boarding Houses ”	1	5 00 “ 10 “
“ “ “ Act to regulate Maternity Boarding Houses ”	1	5 00 “ 10 “
Total amount of fines		\$127 00

EIGHTEENTH ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH OF ONTARIO

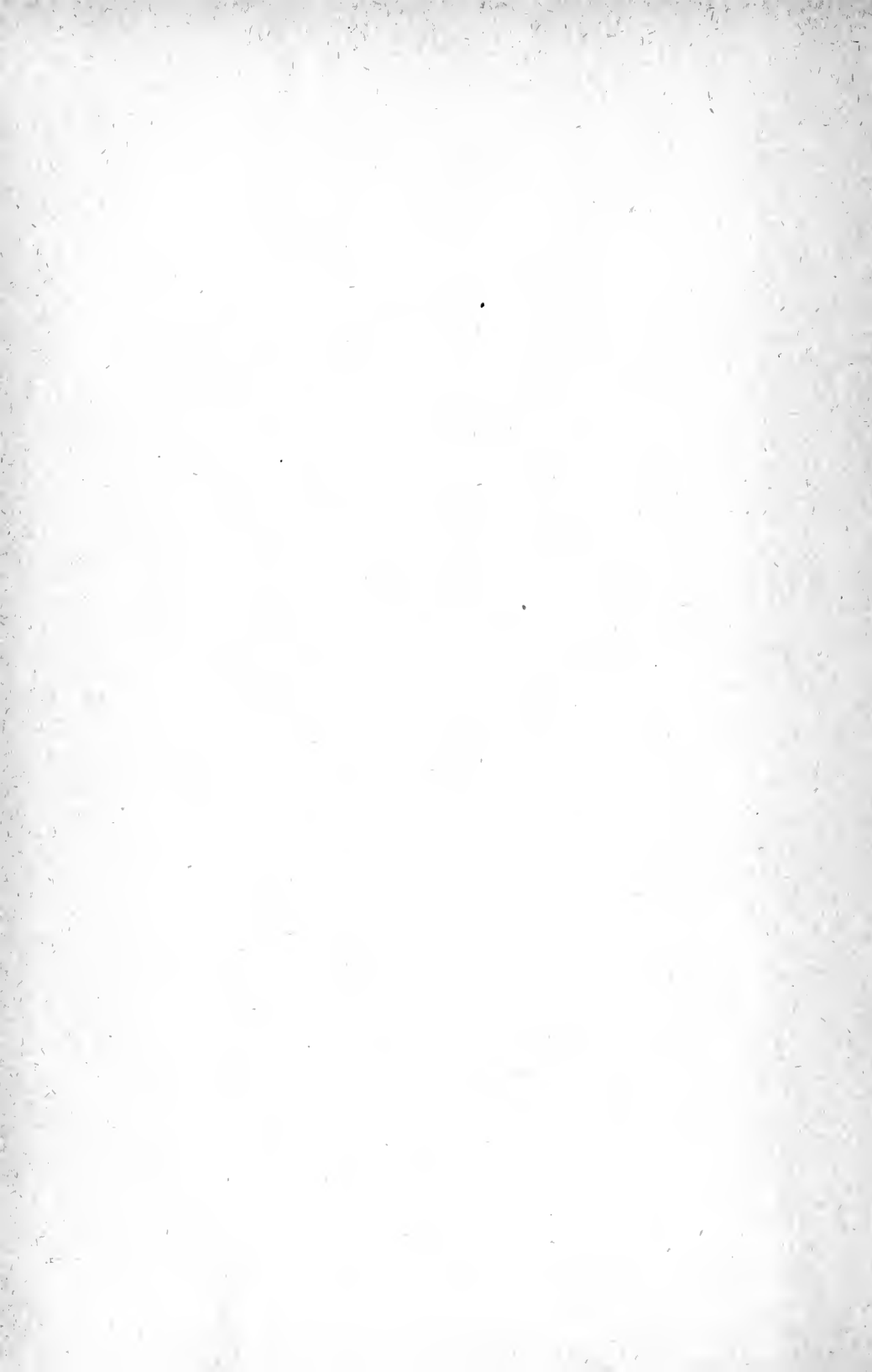
BEING FOR THE YEAR

1899.

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO.



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1900.



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PROVINCIAL BOARD OF HEALTH.

INTRODUCTION.

To His Honour the Honourable SIR OLIVER MOWAT, K. G. M. G., Lieutenant-Governor of Ontario.

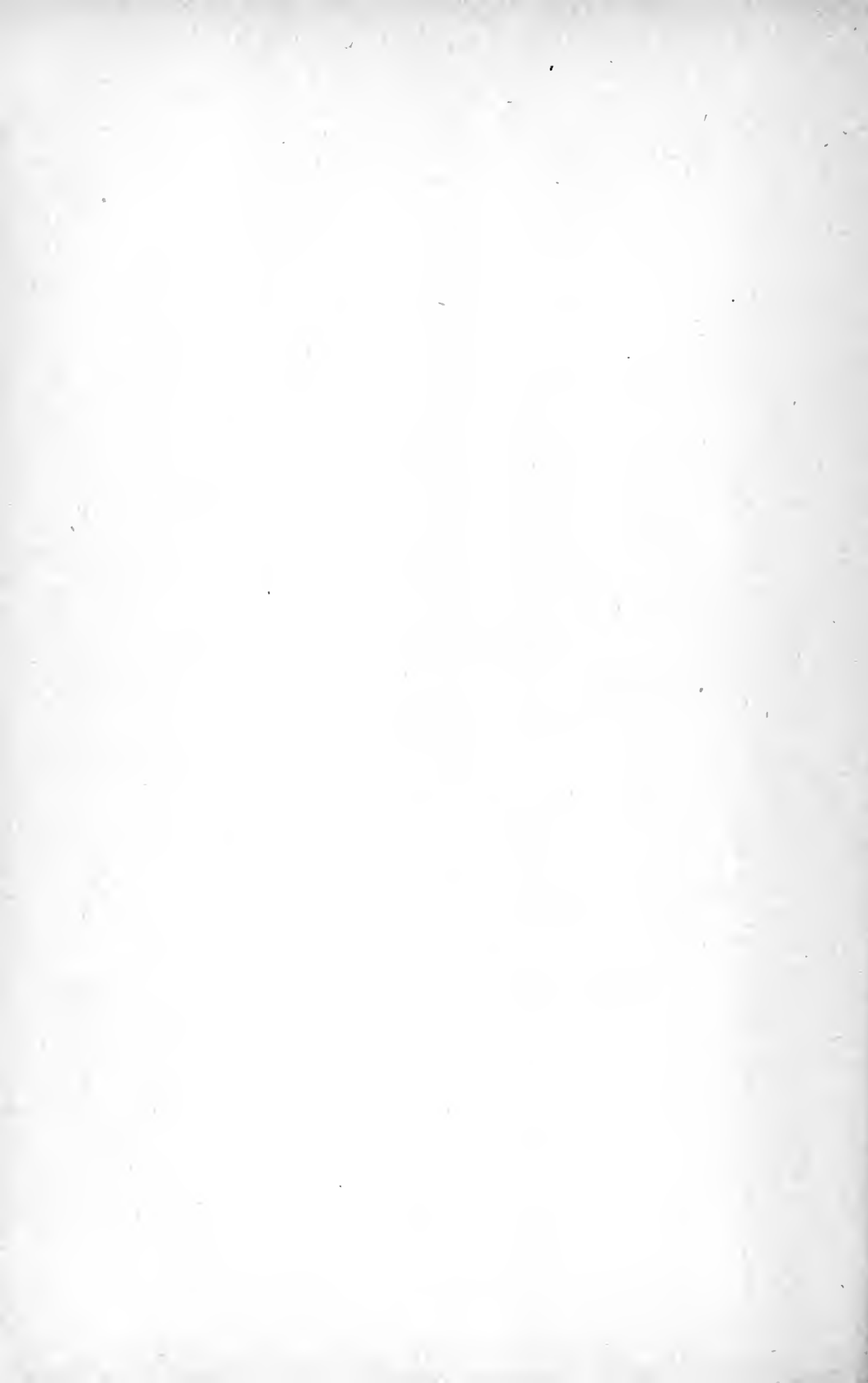
MAY IT PLEASE YOUR HONOUR :

The Provincial Board of Health hereby presents its Eighteenth Annual Report, and has again the satisfaction of reporting that throughout Ontario there has been enjoyed a fair condition of healthfulness. Diseases of the nature commonly spoken of as epidemic and infectious have appeared on some occasions within our borders. Typhoid fever and diphtheria seem to be ever present to a limited extent amongst us, and phthisis still has its many victims. Smallpox also, of both severe and mild types, has appeared for a time in districts opposite the American frontier, having been introduced into the Province from the United States. A few instances of it have also appeared in other localities removed from the frontier, as Brantford and Toronto ; but toward the end of the year it has everywhere been of a character of unusual mildness, due, some believe to the immunity inherited from a nearly universal protection from it by vaccination in past generations of the populations among which it appeared. On the Quebec border also the disease has appeared, it having been there introduced also from the United States. Wherever those diseases were reported to have appeared measures were taken by the Provincial Board of Health to limit their prevalence, and it may be stated with satisfaction that the efforts of the Board have been successful.

The Board would again desire to notice the very infectious and everywhere present consumption, and again to bring under public notice what, so far, appears to be the only mode by which its prevalence may be limited, that is to say, by the establishment of "Homes for consumptives." It would seem that such homes should necessarily be at the public cost and under public supervision.

Respectfully submitted,

J. D. MACDONALD,
Chairman.



ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH

OF ONTARIO.

PART I.

REPORT OF THE SECRETARY.

CHAPTER I.

COMMUNICABLE DISEASES IN ONTARIO IN 1899.

In conformity with the practice of many years, it again becomes my pleasurable duty to summarize, in my report to the Provincial Board of Health, the main features which have marked the public health of the Province during a past year. In a succeeding chapter I have indulged in a historic retrospect of the conditions, social and scientific, upon which the progress of public health during the century just closing has depended. With such a history, it will have been noticed in the *resumés* of progress presented for your consideration in the Reports of 1891 and 1897 that the work of this Board during nearly two decades has kept in close touch, and its results have, it would seem, been closely parallel with the progress of public health during the century.

During the year 1899, we have again to record a general high average of health, as may be seen in the table of deaths, recorded monthly by the division registrars of the 770 municipalities. The average percentage of returns made has been very high, both of population and of registrars recording. Hence comparison with the actual schedules returned to the Registrar-General at the end of the year will compare closely with these monthly returns.

Deaths from Communicable Diseases, as per Monthly Reports made to the Registrar-General in 1899.

	Scarlatina.	Diphtheria.	Measles	Whooping Cough.	Typhoid	Tuberculosis.	Total including Tuberculosis.	All other causes.	Grand total.	Average population reporting.
January..	23	48	5	9	22	184	294	1,864	2,154	2,222,504 97 % of total population.
February..	32	35	2	3	15	215	303	2,265	2,568	
March...	36	25	2	9	17	235	324	2,037	2,361	
April....	28	33	4	7	15	257	344	1,729	2,073	
May.....	17	18	3	7	18	230	292	1,474	1,767	
June.....	12	22	5	4	13	157	213	1,308	1,521	
July.....	7	20	4	6	15	178	230	1,413	1,643	
August....	8	25	5	16	55	172	281	1,807	2,088	
September	10	21	0	8	55	190	284	1,683	1,967	
October..	8	34	4	7	88	194	335	1,665	1,940	
November	12	40	6	8	40	146	252	1,249	1,501	
December	20	42	3	6	28	157	256	1,587	1,843	
Total...	213	363	43	90	381	2,315	3,409	20,021	23,426	
Rate per 1,000 per annum..	0.09	0.1	0.02	0.04	0.1	1.0	10.0	

If we are to judge regarding the reduction of the total mortality for 1899, as compared with 1898, by the records of deaths from contagious diseases, the gratifying conclusion is arrived at that this year will show a total record of deaths lower than in 1898, as it was 1,527, as compared with 1,755 in 1897. That this is the case has been learned from the summary just completed of the returns for 1899, completed at this date of writing, the total deaths being 1,094. Amongst the more interesting facts that this almost continuous reduction of deaths from contagious diseases seems to teach us is that the supposedly widespread existence of—as Sir John Simon expressed it—*cosmical conditions* as promoting the pandemics of disease plays an insignificant part. While we may believe such as still playing some part in epidemic appearances of various diseases, yet it is small as compared with the neglect to exercise those means directly within our control for limiting the spread of the ordinary communicable diseases. While the history of nearly two decades of public health work in Ontario makes it possible for us to say this, yet certain facts known to us with regard to the several diseases make it quite plain that there are to-day, as have been observed for two centuries, notable variations in the type of disease, due partly to seasonal, or perhaps cosmical cases, but rather, we think there is evidence to believe, depending more largely upon some personal element with its immediately local environment, which establishes the type of disease in an epidemic. It would seem, indeed, as if there are often present two contending forces, the personal and the climatic or cosmical, striving for the mastery. In no instance within the memory of the active health officer of to-day has this been more often illustrated than regarding smallpox.

Smallpox and the types of smallpox. Along with your Secretary there are members of the Board who have intimate knowledge of smallpox during the outbreaks of the past twenty years in Ontario. For purposes of comparative study it is of interest for us to go back to 1870, when the first pandemic within the period of modern sanitary organization made its appearance. Regarding it the Annual Report of the medical officer of health for England in 1874 stated "The epidemic of smallpox which began in England toward the close of 1870 and terminated in the second quarter of 1873 was part of a general epidemic outbreak of that disease, of world-wide diffusion, marked wherever it occurred by an intensity and malignity unequalled by any previous epidemic of the disease within living memory. Both in tendency to spread and in several of individual attacks it tested to the very utmost the value of such defences as had been provided against it by vaccination; killing the unvaccinated in far more than ordinary proportion; killing also in unusual proportion persons (especially those beyond the age of puberty) whose previous vaccination had been imperfect; and even prevailing more or less against many vaccination defences which would have borne the stress of any ordinary epidemic. The smallpox deaths in England during the $2\frac{1}{2}$ years of this epidemic were 44,433 in number."

The pandemics of the disease in those years shows itself in the mortality returns of Ontario, which are set forth diagrammatically in the report for 1898, by years and decades. The disease reached its height in 1874, one year later than in England, declining again but never disappearing, only to reach a climax in 1879. Since 1879 the total deaths in Ontario have been 167, while there were 195 in 1879 alone. During the past twenty years the type of disease has markedly varied. The first serious outbreak in 1884 in Hungerford began so mildly that for two months it was called by the physician in charge *black measles*; but in all there were 204 cases in one township alone and 33 per cent. of deaths, so rapidly did the type change and become more severe. It began in a practically unvaccinated French population. The succeeding year, 1885, witnessed the most terrible outbreak of the century, it beginning in Montreal in a series of mild cases not at first diagnosed as smallpox. For several months, from April to June, the disease was allowed to extend, in which latter month 22 deaths occurred. Including these 3,175 deaths occurred in Montreal alone during the latter six months of the year. Through the action of the Provincial Board of Ontario, set forth fully in the report for 1885, but 16 deaths occurred in 146 cases growing out of the Montreal epidemic, or 10.9 per cent. But two other outbreaks with high mortality have since occurred, one being a localized one in Elgin in 1889, with 49 cases and 13 deaths, and one in 1894 with 36 cases and 5 deaths, or 28.9 and 13.8 per cent. respectively. We are thus brought to the present year with the following record of cases and deaths:

Smallpox in Ontario in 1899.

County.	Municipality.	Cases.	Deaths.	Date of Occurrence by Quarters.
Leeds	Wolford Tp.	5	3	Winter Quarter.
Prescott	E. Hawkesbury Tp.	10	2	"
"	Vankleek Hill Town	5	2	"
Stormont	Osnabruck Tp.	10	3	"
"	Cornwall Town	1	0	"
Dundas	Williamsburg Tp.	4	2	"
Essex	Windsor City	1	0	"
"	Colchester Tp.	5	0	"
"	"	"	"	"
"	Walkerville Town	1	0	Summer Quarter
"	Sandwich E. Tp.	25	1	"
"	Pelle River Village	2	0	Autumn Quarter.
"	Maidstone Tp.	30	0	"
"	Rochester Tp.	128	1	"
"	Tilbury W.	86	0	"
"	Tilbury N.	26	0	"
"	Sandwich S.	1	0	"
Kent.	Tilbury E.	2	0	"
Middlesex	Caradoc Tp.	1	0	"
Lambton	Sarnia Town.	2	0	"

Thus not only have we the difference between the 13 years preceding 1882 and the 17 years since of 886 deaths as compared with 147, but the generally less percentage of deaths in the latter period, down to the remarkably mild epidemic of the latter half of 1899. The actual statement of cases and deaths is seen in the table, and the difference between the cases in the earlier part of the year and the latter is very remarkable. The first fatal outbreak grew out of cases apparently so mild, amongst workmen on the Soul-anges Canal, near Montreal, in December, that no physician was called in for the first cases, and no mortality resulted. The Wolford outbreak, whose origin it has not been possible to discover, was of excessive virulence, the first victim being a dry goods clerk, exposed in no way except through goods, as far as known, yet who died, as well as his nurse and sister after him.

The cases in the townships of Essex present a history in every way parallel to many hundreds in the neighbouring States as may be illustrated from returns from various States for the period set forth in the following table. The whole preceding year has shown very similar outbreaks.

Smallpox in United States during December 29th, 1899, to February 9th, 1900.

	Cases.	Deaths.
Alabama	22	.....
Arkansas	60	8
California	3	.....
Colorado	15	.....
Delaware	(not given)	1
Washington	5	.....
Florida	12	.....
Georgia	119	.....
Illinois	49	4
Indian Territories	75	.....
Indiana	73	.....
Iowa	16	.....
Kansas	17	.....
Kentucky	26	.....

Smallpox in United States during December 29th, 1899, to February 9th, 1900—Continued.

	Cases.	Deaths.
Louisiana	772	87
Massachusetts	7	2
Minnesota	29	
Mississippi	153	9
Missouri	60	4
Nebraska	6	2
New York	8	
North Carolina	274	
Ohio	150	
Oklahoma	55	
Oregon	3	
Pennsylvania	11	
South Carolina	5	
Texas	252	3
Utah	11	
Washington Territory	117	2
West Virginia	26	
Wisconsin	7	1
Canada :		
Province of Quebec (14 Municipalities)	473	
New Brunswick	116	

As an illustration of the true character of this disease, the following synopsis of cases which occurred in West Tilbury is of much interest. It is a summary of facts in the outbreak of smallpox in November and December, 1899 by Dr. W. F. Bryans, physician in charge. The disease appeared in 11 houses, with 85 inmates. There were no deaths.

Smallpox in Tilbury West Township in 1899.

Family.	No. of Members.	Had Smallpox previously.	Had old cicatrices of previous vaccination.	Vaccinated at or about time of exposure.		Cases.
				Successful.	Unsuccessful.	
No. 1..	6	0	0	4	2	2 severe, 4 mild..... 6
" 2..	9	.....	3	6	0	6 took mild disease.. 6
" 3..	7	1	5	1	0	1 had mild attack... 1
" 4..	12	0	8	3	1	1 baby, semi-confluent 1
" 5..	6	0	1	0	5	5 took disease..... 5
" 6..	10	0	4	.....	6	6 took disease..... 6
" 7..	4	0	1	3	0	3 mild cases..... 3
" 8..	7	1	2 (not well marked).	0	4	6 cases..... 6
" 9..	6	0	2	0	4	4 cases..... 4
" 10..	9	1	3	0	5	5 cases..... 5
" 11..	9	1	2 (not well marked).	6	0	7 cases, mild 7
	85	4	31	25	27	48

Thus of 4 with previous smallpox, all escaped ; of 28, with good old cicatrices, all escaped ; of 3, with poor old cicatrices, all took disease mildly ; of 20 vaccinated successfully, all took disease in mild form ; of 27 unvaccinated, all took disease. And it was apparent that vaccine if in some cases used on the unvaccinated early enough to protect was probably too attenuated to do more than modify the disease with which in many cases it ran concurrently

These two outbreaks are referred to in detail in the quarterly report of the Committee on Epidemics of the Provincial Board of Health, dated Feb. 14th, 1900, are found in Part II, of this Report. That report concluded as follows :—

"There is on the statute book a law making it compulsory that the council of every municipality shall from year to year appoint public vaccination stations and vaccinators, and that every child within three months of birth must be vaccinated and a certificate of successful vaccination be produced, under penalty.

This Board may or may not feel that it has done all in its power to have this statute carried out. The fact stands that the law in this regard is practically a dead letter. Thus we have demonstrated once more that the very force inherent in preventive medicine is the very means destructive of its imperative influence and acceptance by the general public. The public cease to fear the gods, unless they punish.

Regarding vaccination, we have a right to appeal to the public conscience of Ontario, where our people have seen the world's most frightful disease practically banished, in the words of Kipling's "Recessional"—a true prayer for the people—

"Lest we forget ! Lest we forget !"

But the practical action for the Provincial Board to carry out is that, knowing these facts *re* vaccination, knowing smallpox as we know it in all its horrors as well as its vagaries, the Board shall not for a single instance, through fear of a popular cry based upon lack of knowledge and forgetfulness of the tear-stained pages of even a quarter of a century of history, fail to deal with the disease in the only way left open to it, and to encourage all physicians, not one in a hundred of whom of the younger men have seen a single case of smallpox, to call for assistance in diagnosing all suspicious cases, and when once diagnosed isolate immediately, vaccinate all exposed persons and insist while the danger is imminent upon a general vaccination of the public.

This, and only this, as we have seen in the record of the last ten years, has preserved the public health, and the dignity of a scientific truth transmitted by the immortal Jenner and maintained only after unremitting labor.

As with Sir Humphrey Davy's safety lamp for the miners, the people may never learn the scientific principles by the application of which in a few weeks he discovered that life-giving apparatus, so vaccination, like it, has carried its beneficial influence through the century, and will so continue to the end."

" Truth crushed to earth shall rise again ;
The eternal years of God are hers ;
But error, wounded writhes in pain
And dies among his worshippers."

2. DIPHTHERIA OUTBREAKS. There has been nothing more gratifying in the history of the progress of preventive medicine during the past decade than the change which has taken place both in the definite knowledge of the causes and relationship of this disease and the means of its prevention and cure. Yersin and Roux, in France, began just ten years ago those remarkably exact experiments which have taught us to discriminate between diphtheria and pseudo-diphtherias, which have enabled us, through the microscope and culture methods, to determine the nature and degrees of danger from mixed infections, and which latterly, through the remarkable studies of Westbrook, have shown us that the bacterial flora of the buccal and nasal tract presents differences in species, in variety, in activity of their toxic products, and the stages of their development, hitherto quite unknown, if not unsuspected.

But alongside of such knowledge has been an equally great progress in the application of the principles of serum therapy through the development of the methods of manufacture of the antitoxin of the virus of the disease. Doubt as to its utility and mistrust as to its possibly injurious effects have practically disappeared, and it has become possible to print the results of these glorious achievements in statistics of a decreasing mortality.

The following extract is taken from the Report of Birth, Marriages and Deaths in Ontario for 1898, published in 1900 :—

"The total deaths from diphtheria and croup in 1898 were 634, as compared with 976 in 1897. There is no disease in which the progress of preventive medicine has been

more marked than in diphtheria during the past ten years. The following table of deaths in Ontario in successive years is illustrative :—

Table showing Deaths from Diphtheria and Croup in Ontario.

1887.....	1,786	1893.....	1,044
1888.....	1,489	1894.....	1,075
1889.....	1,101	1895.....	942
1890.....	893	1896.....	926
1891.....	955	1897.....	976
1892.....	890	1898.....	634

The remarkable falling off so pronounced in 1898 must doubtless be due to various influences, amongst which primarily may be placed the greatly increased knowledge amongst the people of its extremely contagious character, and the greater activity of the Local Boards of Health in suppressing outbreaks; secondly, to the seasonal influences peculiar to the year 1898, but especially to the greatly increased use by physicians of antitoxin, both in a curative and a preventive way. Comparisons with other states and countries have been made in previous tables, but the following reductions in deaths since 1894 in the various cities will especially illustrate the decrease due to the last cause, since the use of antitoxin in America only began with 1895, while in France and Germany it was much used in 1894 :—

Decrease in Deaths from Diphtheria in Different Cities.

City.	1894.	1895.	1896.	1897.	1898.
New York.....	2,258	1,634	1,555	1,377	992
Boston.....	817	588	516	411	170
Chicago.....	841	1,775	955	702	622
Paris, France.....	1,109	421	444	298	259
Cities of Massachusetts, including Boston (pop. 1,611,780).....	1,376	1,484	1,348	1,107	507
Berlin, Germany.....	1,361	934	515	507	608
London, Eng.....	2,670	2,316	2,683	2,263	1,772
Toronto.....	110	147	132	161	63
Hamilton.....	72	11	14	19	22
Ottawa.....	124	78	41	44	32
London.....	48	9	10	20	11
Kingston.....	5	26	21	12	3
Brantford.....	10	18	10	8	2
St. Thomas.....	1	8	19	12	3
Chatham.....	12	5	4	1	2

The annual reports of Local Boards of Health, as well as references in the quarterly reports indicate that there still occur isolated outbreaks which tend to become epidemic, but they may be said to be confined to a few counties where social progress has not so definitely advanced as in the greater proportion of the Province. The motto of the Board has not yet been learnt by rote by all the people: "*Ne percat populus scientia absente.*"

3. SCARLATINA AND MEASLES. These diseases have not shown any tendency to take on a virulence of type which would make them to become causes of severe mortality. A preceding table shows how low the mortality from these causes has become. Nevertheless with regard to the former there are enough of deaths to indicate the disease to have been present in instances in epidemic form, and this fact associated with its general mildness may well cause physicians and householders everywhere to heed the teachings of the early masters with regard to inflammatory changes in organs. Their terms exist to-day and Albutt still uses the terms *scarlatina simplex*, *septic* and *toxic*. In a record of 4,015 cases treated in a London, England, hospital, simple albuminuria occurred in 4.25 and acute Bright's disease in 3.4 per cent. of the cases; and regarding albuminuria, Albutt says: "I hold strongly to the belief that although changes in the renal tissue are by no means necessarily present in an ordinary attack of scarlatina, yet simple albuminuria of any degree and acute nephritis when they supervene are due essentially to the same morbid process, varying simply in intensity, or in the vulnerability of the kidney in the particu

lar subject. The assumption that a simple albuminuria and a nephritis are both the expression of the same morbid action varying mainly if not entirely in respect of degree is supported by certain facts of their development."

They both show a tendency to develop at the same stage of the illness or during the second and third weeks." Apart from the fact that the desquamative process in any but the mildest cases is not over before the fourth and fifth weeks, or later, it is apparent that medical health officers are doing no less than their duty to insist on careful isolation in the bed chamber of even mild cases, so that, especially amongst the poorer classes, this danger of a melancholy ending of the disease may be limited.

4. TYPHOID FEVER AND ITS DISTRIBUTION. It has been remarked in previous years that fevers, notably those of the enteric class, in which the Registrar-General includes all deaths returned as malaria, have shown a notable decline in the last ten years. The following table shows their distributions by classes of municipality, and by months.

Deaths from Typhoid Fever in Ontario in 1899, from Monthly report of Registrar General.

Months.	Cities.		Towns and Villages.		Townships.	
	Number of cities having deaths.	Deaths.	Number of towns with deaths.	Deaths.	No. of townships with deaths.	Deaths.
January			6	8	14	14
February	2	3	5	6	6	6
March	4	3		0	7	7
April	3	5		0	7	7
May	4	7	4	4	8	8
June	1	2	1	1	5	5
July	2	3	3	3	6	6
August	8	21	11	16	14	14
September	4	18	17	19	17	17
October	7	25	23	31	21	21
November	4	10	3	3	18	18
December	6	7	10	11	13	13
Total		104		104		125

The following is the distribution of the population by the municipal census of 1898 :

Cities.....		440,889
Towns and Villages	Towns { 314,820 Villages { 137,747 }	452,567
Townships.....		440,889

Apart from the tables illustrating a remarkable immunity from deaths from this disease the distribution is of some interest as serving to illustrate how, relatively, cases exist to a seemingly greater extent in rural places and villages in winter than in summer. Of the cities Brantford alone indicates a notable prevalence of the disease, which is explained in the annual report by the fact of the two wards where wells are still in use largely, having been flooded by the Grand river in spring time, and filth was carried into wells and cellars.

The total deaths in individual cities is given in the following table :

Deaths in cities from Typhoid.

Brantford	17	Ottawa	22
Belleville	3	Stratford	2
Chatham	1	St. Thomas	2
Guelph		St. Catharines	3
Hamilton	12	Toronto	35
Kingston	4	Windsor	4
London	5		

5. THE ABATEMENT OF NUISANCES.—From activity in this work almost more than in dealing with outbreaks of contagious disease have we become accustomed to gauge the sanitary progress in municipal organization of municipalities. Discrimination in com-

parisons must be made between cities, towns and villages; and nowhere can it be better illustrated than by reading the annual reports of the Local Boards of Health and their officers in Part II.

Thus the medical officer of Brantford points out that the typhoid prevailed when the wells were low in August, where filth was distributed by spring floods in the low wards of the cities. Of the 148 cases reported, 30 were users of "city water," and in almost every one of these cases local causes were sufficient to produce the disease; as, for example, 8 cases occurred where defective and foul cisterns ventilated themselves into cellars; three others occurred where the sink discharged into the cellar." It has also been found, from a series of tests of well water taken in various parts of the city, that it was almost universally contaminated with organic matter and sewage, thus the probable cause of disease."

The adoption of a system of town removal of refuse is one of the later stages of the evolution of sanitary work in the cities. Windsor has this year among the smaller cities adopted the contract system; but St. Thomas has made no advance, except to allow the scavenger to collect at a rate paid by the city and at his own risk as regards payment. The city of Ottawa report states that the city has no proper system of garbage disposal, and urges the need of an incinerator for the purpose. St. Catharines similarly has not developed yet any systematic means for garbage disposal, while Belleville has the common system of allowing certain persons to act as scavengers, charging householders a fixed rate, collected at their own risk.

With regard to this class of work in rural municipalities, there, too, we find most notable variations, marked from systematic work in a few to almost total neglect in others. The three matters upon which their energies are most exercised are cheese factories and creameries, and their associated piggeries, there being 1,180 of these factories in existence in the Province, which with their increase have stimulated equally the hog-raising industry. The annual reports of the Creamery and Cheese Factory Associations, containing detailed accounts of the sanitary defects found by their inspectors in and surrounding factories, tell the story of how the rural health boards fail almost completely in dealing with local nuisances caused by such factories and piggeries.

The correspondence of the Provincial Board likewise to some extent reveals the same difficulties, and when it is remembered how delicate are the biological factors governing the production of well flavored, wholesome butter and cheese, it will be seen that an industry with a production in 1899 worth some \$20,000,000 may become the means of great advancement or injury to the sanitary as well as commercial interests of any community.

CHAPTER II.

VENTILATION AND HEATING OF PUBLIC BUILDINGS.

It is safe to say that while there has been progress in the work of constructing buildings and in the mechanical appliances for heating them, and even ventilating them, in many individual instances during the past fifteen years; yet there is probably no branch of public health work which has shown so little progress in the systematic development in Ontario as this of those methods of heating and ventilation, which even in the most general way, have official sanction and are governed by either legislative or municipal regulations. If one were to seek for an explanation of this it would probably be found, first, in the very nature of the problem. It must be remembered that the moment life in buildings with closed sides began in climates requiring artificial heat, it became artificial. "The wind bloweth where it listeth" are the words of the Teacher, applicable to the free movements of the outer atmosphere only, and all attempts to confine air and heat necessarily cause a departure from nature's methods and convert the problem of supplying its dwellers in houses with fresh air into a question subject to the limitations of a *secundam artem*. A second reason is that for the very nature of the complex life of any population living in populous centres, there are not in Ontario as yet any regulations fixing in any

definite way the size, mode of construction or number of inmates of houses, except where it is stated under the Factory Act that—

Section 15.—(2) "A factory shall not be so overcrowded while work is carried on therein as to be injurious to the health of the persons employed therein.

"(3) Every factory shall be ventilated in such a manner as to render harmless, so far as is reasonably practicable, all the gases, vapors, dust or other impurities generated in the course of the manufacturing process or handicraft carried on therein, that may be injurious to health."

As the Act states, however, these necessary and reasonable provisions shall not apply where persons are employed at home, that is to say, to a private house or a room or place which, though used as a dwelling, might by reason of the work carried on there, be a factory within the meaning of the Act, and in which the only persons employed are members of the same family dwelling there.

It is further provided in the school regulations, Reg. 6, that public school rooms shall have an air space of not less than 250 cubic feet per pupil, with a superficial area of about 12 square feet, a uniform temp. of 67° F., and provision for a change of air three times every hour.

And a third reason is the lack of well-defined methods of ventilating public buildings, readily applicable to different buildings, arranged so as to secure at a moderate expense an adequate supply of fresh air in such a manner as to be free from draughts.

It will thus be seen that the problem of maintaining house air in a condition of purity necessary to make it in some degree comparable to that of the outside air is in practice a difficult one, judging from results; but nevertheless, when it is remembered that an adult man requires 3,000 cubic feet of fresh air per hour, introduced into his living room in order that such air may be maintained at a point where the carbonic acid produced by combustion in the lungs shall not exceed six parts in 10,000 of air, it is apparent that the evils due to lack of ventilation in private dwellings, public buildings and factories, are one of the most serious sanitary questions existing in our communities. The adoption of some artificial or mechanical means for the purpose of introducing fresh air into dwellings is commonly termed "ventilation," and depends upon some method whereby the air of a room may be removed and replaced by outside air, which, owing to its constant movements, always maintains practically the same constitution. This is understood when it is remembered that air moving at the rate of five miles an hour, or that of the gentlest breeze, will renew the air over a foot square 26,400 times. In warm weather ventilation is easily possible by doors and windows, but in cold weather air must be introduced into rooms, through ducts, having been previously warmed by a furnace.

From the standpoint of the public, there is no doubt that apart from a lack of knowledge of the directly injurious effects upon health of residence in badly ventilated houses, and of the existence of practical means of remedying the evil, the prime difficulty is that the individual recognizes by the eye no difference between indoor and outdoor air. He can recognize closeness, coming into a foul air from outer fresh air, but this closeness is looked upon as inevitable, and the deadened sense of smell soon fails to recognize the foul odors. Moreover, the methods of heating and constructing houses vary so greatly that badly distributed warmth in houses makes people more anxious to confine the heat produced than to introduce fresh air.

Amid the questions of economy to the householder, of the architects who are specially sought out because of their ability to give a fashionable outside to houses, of competition amongst the innumerable manufacturers of furnaces, boilers, grates and stoves, all of which are said to be modelled upon the latest scientific principles, it may be well to recall some of the laws underlying what seems so simple, and yet proves to be one of the most difficult practical problems which sanitarians, architects and engineers are called upon to deal with.

To maintain the human body in a state of health, it must not only be supplied with an amount of food requisite for supplying it with energy for work, but it must also consume an amount equal to the task of maintaining the body at a temperature of 98.2° F. As bodies lose their heat both by radiation and conduction, it is plain that non-conducting clothing plays an important part in preventing an undue loss of body heat; but common experience tells us that for persons employed at sedentary occupations in doors, an air temperature of from 60° to 70° F., is necessary to comfort and health. Further

experience tells us that the air of the room must not be in too rapid movement, probably not more than a half-foot per second, and must further, as nearly as possible be as warm near the floor as at 6 feet above it. With the atmosphere in temperate climates ranging in winter between 30° F. and -20° F., it is plain that the amount of heat required to keep the air of a house warm, will depend (a) upon the construction of the dwelling; (b) upon the number of renewals of air per hour, and (c) upon the character of the heating apparatus employed. As regard the construction of a house, it is necessary that the walls be made of materials which are poor conductors of heat, that they may be so built that moisture will not readily get into the interstices of the materials, as with soft brick, unpainted boards, and damp foundations; and that they will be so well built of close materials that air currents will not blow through them. How essential that building materials be poor conductors may be learnt from the notably different conductivities of different substances for heat. Thus, a wall of wood of equal thickness would be three times better as a non-conductor, than one of brick. It is of equal importance to remember that air confined in a close space is ten times as good a non-conductor as wood, hence the important part played by double windows, glass being ten times better as a conductor than wood.

As regards the required changes in the air of the room, it is plain that as this will depend on its size and the number of its inmates, the amount of air to be heated will be simply that required to supply the ideal 3,000 cubic feet per hour to each adult inmate; while the heating apparatus to be chosen will be that which most readily transfers its heat with the smallest loss to the air supplied to the dwelling. While it may be said that, in theoretically discussing ventilation, we need not regard by what method the air to be supplied to a room is heated, yet in practice, the question is a most important part of any system. When carbon or its compounds whether as coal gas or wood is consumed, it produces heat by the union of carbon with oxygen, while hydrogen at the higher temperatures if present, unites with oxygen to form water vapor. In combustion every pound of carbon forms 3.7 lbs. of carbonic acid, and emits heat enough to raise the temperature of 87 lbs. of water from 62° to 212° F. and every pound of hydrogen produces 9 lbs. of water, and emits enough heat to raise 417 lbs. of water from 62° to 212° F. For the purpose of estimating the value of any fuel, it is most convenient to estimate the number of pounds of water which can be raised by any given weight of fuel, though 1° F. or from 32° to 33° F. which is termed a *heat or thermal unit*, and which is roughly applicable for every degree from 32° to 212° F. Experiment has shown that 1 lb. of carbon produces 13,000 units of heat and 1 lb. of hydrogen produces 62,500 units. What then is apparent is that economy in heating means that the largest possible number of units of this heat, instead of being allowed to escape by the chimney, or other way, be transmitted directly or indirectly to the air of the rooms occupied; the air being in such a condition of purity and freedom from movements, and having such evenness of distribution, that a sense of comfort be given to all the inmates.

The modes by which heat is transmitted to the air of a room, viz, by conduction, convection and radiation, all play their part, each being given a greater or less importance according as grates, stoves, furnaces, hot water or steam pipes be the method of heating adopted.

The following results, obtained by Profs. Carnelly and Haldane, of Dundee, Scotland, have much interest in this connection; but they are necessarily to be accepted not so much as indicating the value of any particular system as the mode of application of any of the systems accidentally adopted in those particular schools at that time.

Of 323 schools reported upon 150 were personally visited by Carnelly. The great differences were found in the amount of fuel used per pupil. One large school with hot air furnace, used but 34 lbs. of coal per head in a season, while another used 417 lbs. One with an open fire used but 23 lbs., while another used 239 lbs. In a school for 1,000 scholars the cost in England averaged for installing the system £200 for grates and £500 for low pressure steam. The installation of a mechanical fan ventilating plant with heating cost in a building properly designed for it £850, and put in an old building not specially designed cost £1,000. The results of experiments showed that mechanical ventilation as by fans was much the most effective in maintaining the requisite purity and temperature of the air; was more independent of winds and changing weather; and reduced draughts to a minimum, but has a greater first cost and somewhat

greater cost for maintenance ; but in a town with several schools one janitor could supervise the apparatus in all.

A more recent and perhaps more representative series of methods of heating and ventilation are those found in the Reports prepared under the supervision of the Chief of the District Police of Massachusetts who has special charge of the work of boiler inspection, fire-escapes and the heating and ventilating of public buildings, factories and workshops of the State. The several reports of this Bureau are of extreme interest, illustrating year by year an advance in the scientific supervision of public buildings. The report for 1896, referring to the ventilation of schools, says, "The practicability of ventilating schools admits of no doubt. It is as much a matter of exact knowledge as any problem in engineering or mathematics. It can be done by the aid of power, and may be accomplished by heated shafts or by fans ; all dependence on natural ventilation should be abandoned. The system of mechanical ventilation can be relied upon with certainty. By mechanical means a steady inflow of pure air under all conditions and atmospheric changes can be secured. The extra expense for the power to move air should be recognized and met without question."

"When so many are enquiring how best to secure good ventilation in school and other public buildings, the correct methods gained by years of experience should be made known. In this matter of ventilation there are comparatively few who have made it a specialty and have felt it necessary to perfect their knowledge. The time has been reached when the importance of ventilation is generally appreciated, and there seems to be a willingness to do something for the health and comfort of the pupils in our public schools, and it would be a misfortune not to achieve some real progress."

"Good ventilation consists in the proper arrangement and distribution of the ducts of the incoming and the outgoing of the air, and their relation and correspondence with each other so that the perfect removal of the foul air and the thorough diffusion of the fresh air will be secured. How to supply the occupants of school-rooms or crowded apartments with the proper quantity and quality of air has not always received the attention its merits demand. Something, however, during the past few years has been done towards an intelligent solution of the problem. To know how much air is needed for a given number of pupils in a school-room and to supply it by exact mechanical measurement is now no secret."

"In former reports I have explained some of the methods advocated and in operation in school buildings in the State. One of the methods or systems concerns itself only with supplying air, leaving it to make its way out through ducts provided for that purpose. This is done by means of fans or blowers forcing the air into the room. It is the plenum method. Another system or method advocated is directed to the extraction of the foul air by natural laws, requiring no mechanical means, depending upon the difference between the external and internal temperature, in other words, the tendency of warm air to rise."

"In our experience of the past eight years we have found that the interior temperature of foul-air ducts is practically the same as that of the room. The changes in the temperature are so frequent and the velocity of the wind so various, that, *unless additional heat is supplied to the duct*, the power of the duct or shaft to draw air from the room will fail in many instances to cause upward motion enough to be measured by the anemometer."

"The ways of adapting the means to the end in furnishing to and removing air from crowded rooms are not questions of experiment. The size of ducts, shafts, etc., their location in the rooms and their distribution are not at the present time severe problems. The questions, "Shall the air be taken in at the floor or at the ceilings?" or "Will an upward or a downward movement in the air work to the best advantage?" have been settled upon principles which are available for the practical solution of the problem of ventilation."

"For the effective working of any system of ventilation, it is imperatively required that proper provisions should be made to promote air currents in the right direction, and first in the *fresh air inlet*,—the supply of fresh, pure air from pure external sources. The size of this fresh air inlet is of great importance. In many instances when provided in our public buildings it has been found to be too small. The warming of the incoming fresh air should be considered at this point. Varieties of heating appliances are in use

for the purpose of warming the air, two of which I will mention,—the hot-air furnace and the high-pressure or low-pressure steam apparatus."

The difficulties to be overcome by the adoption of any system depend upon the operation of the same principles. Heating by convection is due primarily to the movement of air upward, heated and by expansion made lighter, and falling again as it is cooled by walls and windows. By these currents of warmed air coming in contact with our bodies, we are prevented from cooling with undue rapidity in the same manner as by conduction the air of the room is cooled by the cold outer walls and windows. It will thus be apparent that with outer currents of air, as winds blowing against a building, the porosity or openness of the walls and the conductivity of the building materials and the doubling of the windows, must all play important parts in the ventilation and heating of dwellings. To minimize the variations of temperature caused by these several influences in different rooms and at different parts of the same room, to maintain the air at a temperature of 60° to 70° F., to secure a humidity of the air approaching 70 per cent. of saturation, and to keep the carbonic acid in the room at a point below six parts in 10,000, or to secure from thirty to fifty cubic feet of fresh air per minute for each inmate according to age, and to do this economically is the *problem of ventilation*.

This must be secured too in such a manner that the velocity at the inlet shall not exceed six feet per second, to be reduced to half a foot per second when coming in contact with inmates to prevent the sensation of draughts, although experiment has taught us that a velocity of two to three feet per second of air at an ordinary temperature may be endured without a sense of notable discomfort. How much this last point means will be understood, when it is remembered that a room containing 500 cubic feet of air having an inlet of twelve inches square, if supplying 3,000 cubic feet per hour, would have a velocity of .83 feet per second while supplying only enough air for one adult person. It is thus apparent that in order to maintain the requisite purity of house-air without an excessive air movement, a minimum air space fixed by some at 750 cubic feet per capita is necessary, thereby permitting some four changes of air per hour.

Apart from the question of heating and propelling the air into a room, it is equally clear that the size of fresh air inlets and outlets is of primary importance in the question of the movement of air. An illustration will make this evident. Assuming that properly warmed air can safely move at a rate of two feet per second without discomfort, and that the fresh-inlet occupied a-quarter of one wall of a square room thirty feet wide, it will have renewed the air in the room within two minutes, or thirty times in an hour. As this air is distributed over a space in the room in columns, four times the volume of that opposite the inlet, the general velocity in the room would be but one-quarter that at the opening, or six inches per second. If further the rate of renewal be lessened, it is apparent that the size of the inlet can still be notably reduced if the distribution of the air at the point of entry to the room is assisted by the shape of the inlet. Many of these elements which enter into the problem have been estimated, and even given their place in tables; but it is well that the various elements of the problem be recognized. This may be done by a single example.

A school house of four rooms, each to have a cubic-air space of 240 cubic feet (or 4x4x15) per pupil for a school of 200 pupils is to be heated and ventilated.

The construction of the building having been made upon the principles of building already indicated, we have to supply means of ventilation for supplying 2,000 cubic feet of fresh air per pupil per hour, or 100 000 cubic feet per hour must be poured into each room with cubic capacity of 12,000 feet. This means $8\frac{1}{2}$ changes of air per hour, or a renewal of air every $7\frac{1}{2}$ minutes. An inlet of 2 ft. x 2 ft. would deliver the requisite volume of air if moving at the rate of 6.94 feet per second. With the ordinary smooth ducts, as when lined with tin, to prevent friction as far as possible, it is estimated that from 20 to 25 per cent. is lost by friction, so that in the present instance the duct delivering air in the amount stated at the rate indicated should be about 2 ft. x 2.5 ft. in area. It is apparent that the forward movement of this volume of air will depend not only upon a steady motive power, *a vis a tergo*, by which, as with a fan, a regular pressure is maintained in the duct, thereby creating a plenum in the room, but also upon there being a free exit duct to conduct the air from the room, which removal of air can indeed be accelerated by an exhaust fan at the outlet of the duct or by a coil of steam pipes in the exit shaft by which the air is heated and thereby made to ascend. Much experience

in ventilating shafts by the officers of the Massachusetts Bureau leads to the conclusion that, "as a rule, a reduction of one-fifth the area of the foul air outlets for the size of the fresh-air inlets has proved sufficient for inflowing fresh air. I have seen no reason to change this statement, and it will be found that ventilating engineers and architects who have been the most successful in obtaining good ventilation have varied but little, if any, from the above rules." It is apparent that with the size of the inlets being determined as being, say 80, the outlet would be presented by 100. Along with the various elements as regards the size of inlets and outlets, it is important to have determined by experiment the most successful points at which inlets and outlets should be placed in any room, in order to promote the even distribution of the air introduced. Both English and American authorities are now agreed that in rooms of the ordinary size, as those in schools, inlets should be arranged on the inner walls, at a point from 6 to 8 feet above the floor, while the outlet should be at the floor in the same wall, and in close proximity to the outlet. This arrangement is based upon the fact that the incoming air is usually warmer than that of the room and therefore tends to ascend, and with the forward movement the impulse along with the higher temperature will distribute the fresh air to the farther side of the room; it being further aided by the lessened pressure caused by the downward movement of the chilled air along the outer wall, and the outward movement of this air along the floor to the outlet.

Summing up these points Mr. R. R. Wade of Boston, Chief of the Police Inspection Commissioners, says:

"Whatever differences of opinion may exist as to the merits of the various appliances that have been applied for the ventilation of schools or other public buildings, it must be admitted that the system that can furnish and remove under perfect control a sufficient amount of air, with a velocity that can be regulated and so distributed as to supply fresh air and remove foul air from each room with regularity and perfect independence of weather, summer and winter alike, should be the system to be adopted, and in all appliances that is the simplest which most positively and directly effects the purpose in view."

The problem of heating the air equally has in every system proved of much difficulty in practice when a definite amount of fresh air is to be delivered. In estimating the work to be done, it is apparent that an average external temperature must be taken as the basis of ordinary work, and that for extremes a system of extra coils must be supplied either in the rooms or in the cold air chambers in the basement. A four-horse power gas engine has been proved sufficient to give to a 4 ft. diameter fan enough revolutions to supply 1,000 persons (pupils) with 2,000 cubic feet per head per hour; hence with any system of steam heating, boilers of sufficient power can be economically used, even where electricity is obtainable for supplying power to the fan.

In the problem here we may assume that the outer air to a temperature as low as 15° F. is to be heated in the basement cold-air chamber, to be delivered in the room at 70° F., and that for colder weather steam coils be placed in the rooms for subsidiary heating.

In practice it may be said that the same number of heat units is required to raise water through any degree of temperature from 32° and 212° F., and proportionately air through any degree from 15° to 70° F., the ratio between air and water being at 212° F. as 1 to 1000. Now the weight of a cubic foot of dry air at 32° F. and 30 inches of barometric pressure is 566.9 grains, or 1000 cubic feet equal 81 lbs. Assuming that a cubic foot of water at 212° F. weighs 60 lbs., it will hold 10,800 units of heat. Hence it would raise 3272 cubic feet of air through 55° F. It has been estimated that the combustion of 1 lb. of coal will produce 14,000 heat units, and if the combustion in an ordinary furnace amounts in loss to 3200 units, or more than one-fifth, we find that 1 lb. of coal will raise 1 cubic foot of water from 32° to 212° F., or will heat 3272 cubic feet of air. Or, roughly, 4 lbs. of coal will be sufficient to heat the 12,000 feet of air required to change the air of a room, 32 ft. x 25 x 15, in 7½ minutes. It is apparent that the amount required will be the same, whether the method of heating be by hot water, steam or hot-air furnace, provided the combustion be equally good in all and the loss of heat the same, if the mechanism provided supplies the heat to the fresh air all at the same rate.

Taking warm weather with cold weather throughout the winter season in Ontario, this calculation would mean that, for a school-building of 4 rooms of the above size and

holding 200 pupils, from 25 to 30 tons of coal would supply an adequate amount of heat.

The illustration of principles thus given in some detail enables us in some degree to estimate the various factors entering into the problem of ventilation. Many simple methods are adopted for lessening the evils of over-crowding and air foulness in small buildings, but the scientific problem having had its practical solution in a large measure determined, it now requires some specific measures for its systematic application to schools and public buildings. As an illustration of modern systems in practical operation the following points are taken from the last report of the Massachusetts Bureau, or that for 1898.

The report states the plans are in substantial accord with the recommendations of the Bureau. One is of a building two storeys high, with eight school-rooms, each 28 x 32 by 12 in height, all constructed of brick. The heating is supplied by two steel tubular boilers of about 30 horse-power each. There is also a small boiler for heating the vent flues in mild weather. The radiation is nearly all indirect, massed in two large chambers in the basement, four rooms being heated from each chamber. There are direct radiators in the play-rooms, in the basement, and in the corridors and principal's room; also in the lower hall and in each vent flue. There are 360 to 380 square feet of radiating surface in the steam coils for each room, so arranged that one-third, two-thirds or the whole may be used. Provision is made for drawing the air of school rooms into the cold-air rooms, when the building is unoccupied, for conservation of heat. The buildings have, in addition to play-rooms, wash-rooms and water-closets. Mixing dampers in the fresh air inlets are regulated by thermostats in the different rooms. Ventilation is aided by steam coils in exit shafts. Another building has an amount of indirect heating of the cold-air rooms by steam coils adequate for heating the air with external temperature as low as 15° F., while supplementary heating by direct radiation in the rooms is supplied. A fan for forcing in warm air is utilized. It is apparent that with whatever system we may adopt there are many details in its practical operation which demand intelligent supervision if successful results are to be obtained. The questions of friction and the size of fresh-air ventilating shafts, the velocity of cross-currents of air at the entrance of the shaft for fresh air from the exterior, the variations in barometric pressure and in external air temperature, all demand an intelligent comprehension of such causes and their effects and of the means in the mechanism of ventilation of making compensation for such variations. From the standpoint of legislative enactments to provide for the application of scientific means to secure a standard of ventilation in any public building and for supplying such system of expert officers for inspecting and regulating this work in public buildings in this Province, it would appear evident that at the present time there is no means similar to that for many years in operation in Massachusetts adequate for the work to be done. Local Boards of Health have, under the general provisions of the Public Health Act of inspection, probably enough powers to correct any serious unsanitary condition, but the exact scientific knowledge requiring to be applied to any particular case demands some special scheme to be formulated, so that new buildings in all urban municipalities and all school buildings in rural districts should have their plans approved before construction, with certain proper provisions for ventilation, while definite powers to compel the adoption of adequate measures in old buildings should be put into systematic operation.

CHAPTER III.

THE ECONOMIC VALUE OF SANITATION AS A MEASURE AND MEANS OF SOCIAL PROGRESS.

In the closing chapter, entitled "Dynamics," in his work on "Civilization and Progress," by Dr. John B. Crozier of London, England, are the following words:—

"All thinkers, whether they be Theist or Atheist, Transcendentalist or Materialist Christian or Comptist, feel and agree that there is in man an ideal of expansion and elevation of mind and heart which is not only the end of nature, but is the goal of society, and to forward which the efforts of all the good and wise should be directed."

Again, "It is this ideal which is constantly building up the new civilization, which ever lies more or less concealed under the old, and which when the old has decayed and fallen to pieces, comes forth to take its place."

"This ideal has many sides, but they may be all summed up in the old and well-recognized forms—the love of beauty, the love of right and the love of truth."

Alongside these sentences it may be well to place the words of that man, Sir Humphrey Davy, sprung from the people, and who before he was thirty years of age was teaching all England philosophy, and who was honored with titles by royalty, and worshipped by the people to whom he gave his invention of the safety-lamp, thus saving the life of thousands.

"The scientific glory of a country may be considered, in some measure, as an indication of its innate strength. The exaltation of reason must necessarily be connected with the exaltation of the other noble faculties of the mind; and there is one spirit of enterprise, vigor and conquest, in science, in arts and arms."

We have quoted these several paragraphs as aptly setting forth the truth that he who would rightly understand the forces which in any age have been operative to produce any widespread and permanent influence must comprehend that such are not newly created, but only some new direction given to laws which can never be increased or diminished, just as the law of the persistence of force, causes the phenomena of heat, motion, gravitation, or electricity to appear, force itself never being lost, at the bidding of him who learns nature's processes. Such an one must not alone study religion, or politics, or pure science by itself, but all of them as parts of a whole; since man is of necessity a being influenced through his emotional, intellectual and more material faculties, and is but a single unit in that larger unit of society, which must necessarily become influenced in this same direction before social advancement in any great degree becomes possible.

Nowhere in the history of the past century do we find this more notably illustrated than in the progress of sanitation, a word which is used here in its broadest sense, viz.; "*the science of life saving.*" Take but one illustration, that of the Davy safety-lamp. During the early part of the century the world was repeatedly startled with stories of explosions in coal mines from fire damp. The best minds amongst mine owners and managers had given their energies to the problem of preventing such disasters. Physicians and clergymen in the mining districts, witnesses of the horrors, kept public attention alive to the dangers by pamphlets and letters to journals, not under the thumb of mine owners. On May 12th, 1812, an explosion, the greatest then known, at Gates-head-on-Tyne, killed 92 men and boys, while others less fatal occurred in the next three years. A society finally was formed with bishops and nobility as its prominent members. A report was published and the society received numerous suggestions as to a remedy; finally Davy was appointed to take up the question and within three months of the time he was appealed to, had taken up the question which is one of pure chemistry and physics, and had solved it. Learned societies, owners and managers of mines and the miners' clubs were unanimous in their praises. The Edinburgh Review of the time, said:—"The safety lamp is a present from philosophy to the arts, and to the class of men farthest removed from the influence of science. The discovery is in no degree the effect of accident and chance, which comes in for so large a share in the credit of human inventions, and it has no claims other than on what is altogether the result of patient and learned research."

The moral and intellectual side of this matter is further beautifully illustrated by Sir Humphrey's reply to Mr. Buddle, one of the large mine managers who suggested that he should patent the discovery and make from £5,000 to £10,000 a year. "My good friend I have never thought of such a thing, my sole object was to serve the cause of humanity; and if I have succeeded, I am amply rewarded in the gratifying reflection of having done so."

In these extracts from two writers, one speaking in the opening and the other in the final decade of the century, are clearly set forth the same philosophical truth, viz.:—*That underlying human progress must be the primary knowledge of Nature and a belief in goodness at the heart of things, and that no mere acquaintance with the uses of even scientific inventions in any degree postulates a relative expansion and elevation of mind, which depends upon a consciousness of this ideal in the individual, and of a conscious effort to attain to it as the end of his desires.*

How many of the thousands who ring the telephone bell have the faintest idea the painful steps of a Voltà, an Ampère, a Davy, a Faraday or Bell in their ascent of Panassus, during a whole century, before the simple operation of ordering the dinner by telephone became possible; and how few miners after the first wonder was over, ever

thought of the knowledge of the physical laws required to be known before the simple brass wire mantle of the safety lamp could be thought of !

These preliminary remarks have been made simply for the reason that sanitation being primarily a personal matter, there must, as the condition of sanitary progress, be a breaking down of obstructions *physical, organic and spiritual* in the individuals which constitute any society.

To illustrate : With war as the condition of English society for almost a generation, family bereavements, the maiming and crippling of individuals, the absolute misery and pauperism of the masses had grown to be the normal condition of life for the larger proportion of the people. Social distress had become so extreme that it approached that condition which made the French populace in the days of Robespierre run dancing by the side of the rumbling death-cart, as it carried its daily load of victims to the guillotine; and shouting in their glee "*Il va bien*"—it goes fine ! At the end of the Napoleonic wars, which had kept wheat up to 70s. a quarter, Dives was still true to himself and not content with abnormal gains during all these war years, the agricultural interests had a bill passed in 1816 prohibiting the importation of corn until it reached 80s. per quarter. Misery forced on rioting amongst the masses, hay ricks were burnt, conspiracy after conspiracy for overturning the social fabric and government was formed, ending in the Manchester rising and the Peterloo massacre. But beneath the surface in all this, the new leaven was working. In Agriculture, Mr. Coke, of Halkham, in Norfolk, learnt and practised scientific agriculture till the value of his rentals rose in forty years, from £2,200 to £20,000 largely owing to science applied to agriculture ; and science and the arts were transforming the textile industry. The power loom was in 1815 just coming into use. Cotton production caused from 1815 to 1820, 82,000,000 of imports of raw material to rise to 247,000,000 lbs., with the increase of labor saving inventions. With all this, the great towns grew rapidly, and population rose from 11,000,000 in 1815 to 16,000,000 in 1838 ; yet with all this, wages advanced but little. The masses were still in misery without internal organization and without protective legislation. Trade combinations were prevented by law, and in 1813, the justices were prevented from fixing the minimum wage. It was apparent that such opposed conditions could not long continue. Rioting and rick-burning suited the oligarchy, but Adam Smith, the philosopher, William Cobbett, the social reformer and editor of the "Weekly Register," the Hampton Club with its workmen orators and poets, and isolated aristocratic adherents as Francis Burdett, Spencerian societies for the nationalization of land, the philosopher Hume's advocacy of the right to organize labor were all at work playing their part in the education of society, leading up finally to Catholic emancipation to the Reform Bill of 1832 and to the Factory Commission of 1832 and Poor Law of 1834.

The justness of the proposition that elevation of the individual mind is not adequate for a permanent social progress is seen in the spasmodic reform in prison discipline in consequence of the self denying labors of John Howard toward the end of the 18th century.

Mr. Arthur Griffiths tells us, in "Traill's Social England," that the prison reforms had in large measure lapsed by the end of the Napoleonic wars. So crowded were the inmates that they had to sleep sideways to find room on the floor for all to sleep ; men and women were huddled together and brutality and abuses of management abounded. The peculiarly humanitarian work of agitating this reform was done largely by the Quakers, who were supported by Burton and Wilberforce in the House. The work was herculean, and was pushed forward by these earnest workers in spite of ridicule, even from some of the clergy. Some enactments were obtained in 1825, and the "Cellular" system was introduced in 1835 and in 1837 Lord John Russell swept away in almost a single act, the death penalty for every crime but murder.

It will have been noted that so far not a word has been said regarding sanitary reform, nor indeed was such *per se* to be expected under such social conditions. Disease is a matter of the individual. If he took sick there was the physician, and if too poor then the dispensary and after that the workhouse. Besides did not Providence send sickness, and have not men to die some time ? Destruction by an explosion in a coal mine should be prevented, but who could prevent disease ? None knew the nature of contagion, although many individuals had observed the spread of disease through overcrowding and the presence of filth.

But the time had come with the various reforms growing out of scientific progress and the diffusion to some extent of a knowledge of natural laws, when this, the last born daughter of Science, including as she does the practical application of all the sciences to the science of life, was to have her birth.

And like all the others, Sanitation had her spokesman. Edwin Chadwick, a London lawyer, with a talent for statistics and a deep interest in social reform, addressed a letter to Sir John Russell, the Home Secretary in 1837, at the time when he, Chadwick, was acting as secretary of the Poor Law Commissioners. He pointed out in this letter that preventable diseases became a direct cause of poverty; and as a result of the report Lord Russell appointed a commission of enquiry in 1839, viz.: "As to the extent to which causes of disease prevail amongst the laboring classes in the metropolis; also amongst the laboring classes in other parts of the United Kingdom." This was the year succeeding the passage of the Act relating to the Registration of births, marriages and deaths, and it was the returns of that year which showed that deaths from the preventable diseases, as typhus, smallpox, etc., were 56,461 in a total of 338,979 or 10.6 per cent. of the whole. In 1897 this class in England constituted only 7 per cent. of the whole, and 1839 was a good year compared with the epidemic years of typhus and relapsing fever from 1816 to 1820, with typhus and typhoid again from 1826-30; while from 1830 to 1838 it was epidemic upon epidemic of cholera, smallpox, typhus and Russian influenza. To understand the saving in deaths alone from zymotic diseases it may be said that the population of England and Wales is to-day just double that in 1838, and that the deaths from this class of disease were in 1897 33,595, while had the 1838 rate prevailed in 1897 there would have been 113,000, or the rate has been reduced by more than two-thirds during the period.

Or, as Chadwick put it, with regards a single disease, typhus, "That if 1 in 10 sick persons died of the disease in 1838, as was the actual case in the metropolis, then a quarter of million of people in England and Wales suffered in financial loss and sickness from the disease, or the total deaths in England in a single year from typhus were double the loss suffered by the combined armies at Waterloo.

Loss of this character may further be illustrated by the deaths from consumption, which even more accurately measures the social surroundings of individuals as regards housing, wages and general elevation in the standard of living. The sanitary progress in the last 40 years seen in the decreasing death rate by decades has been from 1861 to 70 an average death of males of 2,467 reduced to 1,598, of females 2,483 to 1,259 per million persons; or 83,700 persons' lives have been annually saved to the state in England, or 90,240 in 1897, over what there would have been had the rate from the early period prevailed. Or the reduction was 44 per cent.

We may refer to a few facts as set forth at length in the Report of 1839 on the Sanitary Condition of the Laboring Classes of Great Britain, drawn up by the commissioners, George Nicholls, Sir George Cornwall Lewis and Edmund Walter Head, Mr. Chadwick being secretary, appointed by Lord John Russell. Street-cleaning and paving in it are recommended, illustration being given of then existing conditions. One section reads: "The civic officers have generally contented themselves with the most barbarous expedients, sitting still amidst the pollution with the resignation of Turkish fatalists, under the supposed destiny of the prevailing ignorance sloth and filth." Construction of sewers and introduction of water supplies was next dealt with. Land drainage was illustrated by the good health due to the draining of the Ely fens. In another section of the report Chadwick deals with the subject of ventilation, one which even to-day demands from us an attention not given to it in any degree adequate to its importance.

In the report it is remarked that the frequency of early deaths and orphanage amongst journeymen tailors led to special enquiries and observations made as to the effects of bad ventilation (a) on the moral habits, (b) loss of healthful existence to the employee, (c) loss of profit to employer and employee through sickness, (d) loss in expenditures for relief under the Poor Law. Most of them died from consumption. By their own rules a man at 50 was superannuated and was thought not fit for a whole day's work. Their average expectancy of life was about 32. No provision was made for their families, and these usually went on the parish.

In statements published is one by a journeyman tailor that the life of a London tailor, who worked in such shops as were described in the report, was shortened over that

of one in a country village or town by ten years, and that the conditions under which he worked caused a loss of one hour's work daily, the two losses together amounting to a total loss of 50,000 hours, which at 6d. meant a total productive loss of £1,250. Such effects of over heated and non-ventilated rooms did not then and do not now limit themselves to any single trade. He gives another example where in four years from 1784, 2,944 children out of 7,650 died at a lying-in hospital in Dublin, but the rate was reduced by proper ventilation to 229. In the Glasgow "Barracks Building" there were 500 people, there being one family to each room, where typhus was never absent, one case dying in every seven; but after a two-inch tube was placed in the ceiling of each room leading directly to the chimney, fever practically disappeared during the next eight years. Statistics showed that in 1840 one child in every 180 and one widow for every 500 of the whole population were in the union work-houses.

Such were the valuable materials embodied in reports and pamphlets for the next ten years by Mr. Chadwick, but not till the typhus of 1847 was succeeded by cholera in 1849 did official sanitation advance to the stage of a regularly appointed health officer for London, when Dr. John Simon presented his first annual report dealing especially with street filth, sewerage and filth diseases, water supply, the social condition of the poor, unsanitary dwellings and offensive trades. What some of these conditions must have been may be judged when Dr. Simon in 1854 dared to say in his City of London Report, "If there be citizens so destitute that they can afford to live only where they must straightway die—renting the twentieth straw-heap in some lightless fever den, or squatting amidst rotten soakage, or breathing from the cesspool and the sewer; so destitute that they can buy no water, that milk and bread must be impoverished to meet their means of purchase, that the drugs sold them for sickness must be rubbish or poison; surely no civilized community dare avert itself from the care of this abject orphanage. If such and such conditions of food or dwelling are absolutely inconsistent with healthy life, what more final test of pauperism can there be, or what clearer right to public succor, than that the subject's pecuniary means fall short of providing him other conditions than those? It may be that competition has screwed down the scale of wages below what will purchase indispensable food and wholesome lodgment. Of these, as fact, I am no judge; but to its meaning if fact, I can speak. All labor below that mark is masked pauperism. Whatever the employer saves is gained at the public expense."

Such reports as this of Dr. Simon were the result of the first health law—"Health of Towns Bill"—passed in 1848, the year of the cholera, the provisions of which were executed by a central board of health till 1855, then by the privy council, and finally since 1872 by the local government board. In this year only was sanitary legislation extended to rural districts, whose general work since 1894 is supervised by district councils.

Such slow growth is wholly in keeping with our postulate, that there must be a general advance in social education in order to make any reform possible and permanent. Illustrative of this is a remarkable sentence by Dr. Simon in his 1854 report: "To the philosopher, perhaps, any partial sanitary legislation—even for a metropolis—may seem of low importance as compared with the corresponding need that the legislation of the country should be imbued with greater sympathies for life. Yet London is almost a nation in itself, and the good which might be effected by its sanitary regeneration would, even as example, be of universal influence." There were millions of people in the rapidly advancing industries of England who were intimately informed on the influences affecting the rise and fall of wages, and had organized trade unions, co operative associations, and the influence of such assisted by such philanthropists as Lord Shaftesbury got Factory Act after Factory Act passed and amongst these that most valuable of all from the sanitary standpoint "The Alkalies Act," with its chief inspector Dr. Angus Smith, an eminent chemist, and its local inspectors.

But such broadening of the horizon of the public mind was accentuated by the re appearance of epidemics both of cholera and typhus in 1865-66. It was in 1865 that the Government ordered certain scientific researches to be begun. Dr. Thudicum, a chemist, was then first employed to study the chemical processes of disease, and from that year onward Annual Reports gave the results of studies upon the diseases of man and animals, such as that carried out by Prof. Grainger regarding the rinderpest in 1867. First in 1865, inspectors of the Government Board investigated epidemics as of typhus at Greenock, puerperal fever at Maidenhead, diphtheria at Great Ormesby, scarlatina at Welling-

ton, typhoid at Hadlow, cholera at Southampton, and yellow fever at Swansea. In the same year medical officers were sent to study foreign epidemics, as the plague in Russia and cerebro-spinal meningitis in Germany. It is in the Report of this year that we find the question of contagion discussed in terms closely approaching those of to-day, Dr. Simon uses the words: "And more and more the once chaotic phenomenology of contagion is tending to become an intelligible and consistent section of the great science of organic chemistry." Indeed, it is in these very years that Pasteur is carrying out the earlier of his remarkable investigations, as into the origin of charbon and the silk-worm disease, which settled for all time the doctrine of a "contagium vivum" on an enduring basis. But how closely clinical facts had already been associated with sanitary observation may be seen from the words of Dr. Simon: "On the other hand, not even the merest tyro in medicine supposes that contagion (as a morbid power acting from each sick centre) operates equally on all persons, or equally under all varying circumstances of place and time." He then refers to (a) personal differences of susceptibility, (b) the local surroundings of contagiously-diseased persons, and the power of contagion to show an almost infinite range of differences, (c) and that in different lands and different ages of the world in category of time, far out of human reach, there are circumstances which greatly influence contagion."

How progress in the belief as to the natural history of diseases has gone on and how executive measures for their suppression have advanced concurrently therewith is gathered from an extract from Dr. Simon's report for 1868. He says: "It is the almost completely expressed intention of our land that all such states of property and all such modes of personal action or inaction as may be of danger to the public health should be brought within scope of summary procedure and prevention." Large powers have been given to local authorities, and obligation expressed or imposed on them, as regards their respective districts, to suppress all kinds of nuisance and to provide all such works and establishments as the public health primarily demands. And in the interests of health the state has not only, as above, limited the freedom of persons and property in "certain common respects; it has also interfered in many special relations"; and he further points out how it had interfered between parent and child, as in vaccination and limitation of hours of industrial labor; between employer and employed with regard to the sanitary condition of factories; between vendor and purchaser in the matter of adulterated foods and drugs and unwholesome food products; and the prevention of epidemic disease at public expense, and in the larger control of municipal works like sewage disposal to prevent danger to public water supplies.

It is in the report of 1869 that Dr. Simon refers to the published work of Dr. Burden Sanderson, and states: "It will now be seen that the views indicated in Dr. Sanderson's report with regard to the agencies of morbid infection are the views of Prof. Schroder and M. Pasteur on the agencies of fermentation and putrefaction. In 1870 Dr. Simon states: "I am glad to state on the evidence of this report (Dr. Sanderson's) that, even at the present very early stage of work, Dr. Sanderson's investigation is giving results which are of direct interest to the practice of medicine and surgery." Within six years thereafter Prof. Lister had immortalized himself by applying the principles of asepticism to the treatment of wounds and had revolutionized surgery.

In the report of 1870 Dr. Simon deals at length with the constitution of local health committees and says what in 1900 bears upon public health work both in England, in Canada and in the United States: "In the first place there is the largeness of the continuing waste of human life. It seems certain that the deaths which occur in this country are fully a third more numerous than if our existing knowledge of the chief causes of disease were reasonably well applied throughout the country; that of deaths which in this sense may be called preventable, the average yearly number in England and Wales is now about 120,000; and that of the 120,000 cases of preventable suffering which thus in every year attain their final place in the death register, each unit represents a large or smaller group of other cases in which preventable disease not ending in death, though often of far-reaching ill effects in life, has been suffered. And while these vast quantities of needless annual suffering, if regarded merely as such, would be matter for indignant human protest, it further has to be remembered, as of legislative concern, that the physical strength of a people is an essential and main factor of natural prosperity; that disease, so far as it affects the workers of the population, is direct antagonism to industry; and that

disease which affects the growing and reproductive parts of a population must also in fact be regarded as tending to deterioration of the race."

The quotations made from these reports during the preceding ten years are of extreme interest, as illustrating the formative stage of present legislation, and show how accurate scientific knowledge accumulating from year to year formed a motive force which, as a knowledge of its practical bearing came to be generally diffused, placed public health legislation both in England and Canada almost upon its present basis. It has been already noted that in 1874, sanitary law in England was made applicable to rural districts, and we find that in 1876 all the Public Health laws were consolidated. Since that time public health work in England has moved on almost uneventfully, each year producing its harvest of lives saved. What this actually was is gathered from the statistics which show that between 1872 and 1882 the death rate in England decreased 4.5 per cent, or in other words 250,000 persons were living in 1882, who would have been dead had the deathrate of the previous decade continued. From this latter year, 1882, the operation of sanitary laws has become a matter of ordinary routine and common knowledge to the people of Ontario, for in that year the Provincial Board of Health was appointed by statute; and in 1884 a Public Health Act, applicable to every municipality in Ontario was passed. A reference to this early period is of interest at the end of eighteen years.

In the report of the Board for 1883 may be found the following sentence. "Let us examine the last published report of the Registrar General of Ontario, (1881,) and we will find there that the recorded deaths from diphtheria for the preceding year were 1171; from scarlet fever 470, and from all those diseases which are readily admitted to "spread" from a first case, there was a total of 3000. During the past year the following question has been asked of a number of medical men. "Do you think that one-half of the cases in your neighborhood could have been prevented if you had had a medical health officer and proper by-laws?" The answer has invariably been "Oh, yes, far more than that". But let us content ourselves with assuming that only one-half of these persons might have been prevented from catching the disease by proper precautions and strict watchfulness, and this will give us 1500 persons who might have been saved from death. Consider along with this, how many of the 2397 persons who died in that year from pulmonary consumption, might still be alive if better ventilation had been adopted. Adopting English calculations of the value to the state of lives saved, this report further stated, "At the end of a period of six years from this date the annual saving would be nearly \$4,000,000." That those roseate hopes have been fulfilled, and that lives to the ideal extent have actually been saved may be gathered from the last published report of the Registrar General for 1898. The deaths from contagious disease, as actually recorded, from smallpox, scarlatina, diphtheria, measles, whooping cough and typhoid were 1,527.

It must be remembered further that the population has increased from 236,739 in 1882 to 440,979 in the cities alone.

Such is a *resumé* of the conditions which have marked the progress of the science of public medicine during the century, now closing, and, were it possible to summarize all the causes producing the wonderful results which we have endeavored to indicate, one could not do better than catalogue the vast development of inventions and discoveries and their practical application in the Arts and Sciences. But along with this development has gone an evolution of scientific thought in its application to social and moral problems, which has depended primarily upon the increasing knowledge of and belief in the uniformity of natural laws. The belief has enormously extended in society that a particular effect *must* have its cause by which we mean that the force which it represents *must* have been taken from somewhere else, that is to say, must have its cause elsewhere; and hence the old beliefs in diseases being visitations of Providence, of there being physical or social laws by which the poor are required to remain poor and that the woes of this life are to be endured with the fatalistic stoicism of a Mahommedan, for the sake of the sweets and joys of a future paradise, have largely disappeared. Amongst even the common people the practical knowledge has grown that they need not have smallpox and hence they demand, it may be spasmodically yet, action on the part of the authorities to prevent it. They have heard that antitoxin cures diphtheria and they are prepared to submit their children to inoculation with it, even though with regard to its action they may be as yet, and indeed will continue to be, profoundly ignorant. Dr. Crozier asserts that these demands for pro-

tection against disease, and a willingness of the individual to submit to personal inconvenience are the true measure of the *level* of the stage of men's material and social progress, or reversing the statement "that our moral ideas, our practical beliefs, all grow out of our *material and social surroundings*."

"So great indeed, is the unity and intimacy, the harmony and proportion existing among the various social and moral products of any given epoch, that, accompanying a particular stage of culture, you may confidently predict a corresponding stage of manners, of customs, of morality, of religion."

Marvellous as by comparison have been the stages of progress in "life saving during the century it would be idle to suppose that these notable illustrations of life-saving in the matter of the so-called preventable diseases are the measure of progress in a directions, as for instance those diseases, which depend more or less upon a phase of social life, which, not marked by material poverty, may yet be marked by a poverty of practical knowledge of and belief in the effects of those conditions of an artificial life growing out of that very material progress in the arts which have brought scientific conveniences to increase the comforts of life in the home of every town dweller. On its purely material side it produces the evils of hot-air furnaces, the poisonous products of water-gas, the injurious results of electric light on the eye, the disturbances of digestion and nutrition by the enormous consumption of sugars, especially, the glucoses, and a long line of evils, to which an earlier generation were not exposed. In the mental sphere, the universal privileges of free education, bringing with the ability to read, the power to learn, not only the great political movements, but all the sensational occurrences of society, whether in the commercial, social or criminal world have similarly their degenerating influence. The effects of this class of teaching on the mind of the child soon to become the man, is patent on every hand; and, unfortunately, it is not antidoted by keeping the child's mind imbued through practical science teaching, with those broad laws governing all phenomena, whether physical or mental. The sensationalism thus developed again manifests itself in the moral sphere and a hysteria in the sphere of religion is the logical outcome of previous influences. Thus the diseases of the nervous system, affecting all nutrition, and diseases of the digestive and secretory organs are notably on the increase, while others such as cancer, seeming to be especially associated with these vices of nutrition, are becoming notably more prevalent. It is apparent to one who would study these current influences, that the ascent of Parnassus is difficult for man in any sphere; and during recent years and not in Canada alone, it has been easy to mark the bearing upon public health work of this false æstheticism. Sir John Simon, writing on "Experiment as a basis of Preventive Medicine," years ago used words which can well be repeated: "In certain circles of society, at the present time, æsthetics count for in all . . . with such sections of society our profession cannot seriously argue. Our own verb of life is *ergazesthai* not *aisthanesthai*. We have to think of usefulness to man. And to us, according to our standard of right and wrong, perhaps those lackadaisical æsthetics may seem but a feeble form of sensuality."

Very much might with reason be added to indicate movements inimical to the highest interests of our public health and we have said enough to point out with our causes for rejoicing at the progress of a century in the amelioration of human misery, and of the marvellous increase in the means for making the lives of every class more enjoyable, the existence of parasitic growths, which seem like those in Nature to be peculiarly prone to attach themselves to our most luscious fruits, and to our flowers of the most delicate perfume.

"There is light in all
And light with more or less of shade in all
Man-modes of worship."

While recognizing, however, these facts, yet the progress and civilization of a century and the conditions upon which they have depended are so evident that we may say that for the coming century and indeed for all centuries all true civilization and progress must depend upon science by which in the words of one of our modern teachers we

would say, "that knowledge of the laws of the world and of the human mind, which alone can enable us to work in harmony with the Supreme Power, and towards the same great ends."

"A sun but dimly seen
Here, till the mortal morning mists of earth
Fade in the moon of heaven, when creed and race
Shall bear false witness, each of each, no more,
But find their limits by that larger light,
And overstep them, moving easily
Thro' after-ages in the love of Truth,
The truth of Love."—Akbar's Dream.—Tenn.

Respectfully submitted,

P. H. BRYCE,
Secretary.

REPORT OF THE LABORATORY WORK OF THE BOARD FOR 1899.

By J. J. MACKENZIE, B.A., M.B., BACTERIOLOGIST.

The total number of specimens examined in the Laboratory of the Board during the year 1899 was 1,370, which were made up of the following items :—

Suspected sputum	629
Suspected exudate	375
Suspected typhoid blood	164
Waters for bacteriological examination.....	116
Waters for chemical examination	29
Miscellaneous samples.....	52
Suspected rabies	5
	<hr/>
	1,370

Of these samples, 1,100 were sent in by 300 physicians, as follows : 112 sent 1 specimen each, 59 sent 2 specimens, 30 sent 3 specimens, 26 sent 4 specimens, 12 sent 5 specimens, 12 sent 6 specimens, 10 sent 7 specimens, 7 sent 8 specimens, 6 sent 9 specimens, 8 sent 10 specimens, 4 sent 11 specimens, 2 sent 12 specimens, 2 sent 16 specimens, 1 sent 17 specimens, 1 sent 19 specimens, 2 sent 20 specimens, 1 sent 22 specimens, 1 sent 30 specimens, 1 sent 32 specimens.

These 300 physicians were distributed as follows :

From 1 municipality.....	33 sent specimens
“ 1 “	7 “ “
“ 1 “	6 “ “
“ 2 “	5 “ “
“ 4 “	4 “ “
“ 9 “	3 “ “
“ 36 “	2 “ “
“ 129 “	1 “ “

In addition to these figures, two municipalities sent all diphtheria cases for diagnosis or release from quarantine through the medical health office, in all 84 specimens. Specimens were received from a total number of 196 municipalities.

Unfortunately with the sputum, exudate and blood samples, only a limited number of cards with clinical history was sent in so that the details of these cases cannot all be worked out.

Tuberculosis. The cards which are received with the samples of sputum ask for the following data : name, age and sex of patient, name and address of physician, date of first symptoms, present symptoms and history of infection, if any. The age and sex of patient and the duration of symptoms have been given with fair accuracy. The presence or absence of infection has been given in the vast majority of cases, and it is hoped that the error through carelessness will be to a certain extent cancelled in both those which give positive evidence of tuberculosis as a result of microscopic examination and those which gave negative results. The question in regard to present symptoms, it is feared, has not been answered as fully as it should be, but the results have been tabulated in so far as they are given. It is hoped that these data taken with the results of the microscopic examination may in time lead to an increase in our knowledge of the earlier symptoms of tuberculosis.

Altogether 441 cards were received with samples of sputum, 172 of these samples showed the presence of the bacillus of tuberculosis and in 269 it was not found (percentage positive 39.0), eight of the 269 were second or third samples from previous cases, so that they are not included in the tables.

Arranged according to Age of Patients.

Age of patient.	5 yrs. and under	6 yrs. to 10 yrs.	11 yrs. to 15 yrs.	16 yrs. to 20 yrs.	21 yrs. to 30 yrs.	31 yrs. to 40 yrs.	41 yrs. to 50 yrs.	51 yrs. to 60 yrs.	over 60 yrs.	No data.
Negative	1	4	7	43	81	53	34	23	11	4
Positive	0	1	1	23	69	31	25	14	5	3
Percentage positive	0	20	12.5	34.6	46.0	36.9	42.3	37.8	31.2	42.8

Arranged according to Duration of Symptoms when Specimens were sent.

Symptoms have persisted.	1 month and under.	1 month to 2 mo's.	2 mo's to 3 mo's.	3 mo's to 6 mo's.	6 mo's to 12 mo's.	12 mo's to 2 years.	Over 2 years.	No data.
Negative	33	39	28	59	55	16	26	5
Positive	8	23	21	46	43	18	9	4
Percentage positive	19.5	37.0	42.8	43.8	43.8	52.9	25.7	44.0

The above table is interesting in regard to the number of positive diagnoses made in the first two months of the disease and the large percentage of negative results in those cases which had persisted for more than two years.

In the former class, of course, one must take into account ordinary inaccuracy of a patient's statements when questioned in regard to the period of time that has elapsed since the beginning of a disease, but in quite a number of cases additional information is given which fixes the date with comparative certainty, such, for instance, as an attack of influenza or pneumonia.

In the latter class we undoubtedly have instances of the so-called fibroid phthisis, as other symptoms point to phthisis even when the bacteriological examination is negative.

The answers to the questions concerning the symptoms at the moment of sending the sputum, have been carefully gone over and have been tabulated according to the actual data given. That is, if pyrexia is not mentioned the case is classed with apyretic cases, except when other data point to the probability of pyrexia, such data as night sweats and emaciation.

The cases are all arranged according to the number of months since the onset of the trouble, and this to a certain extent aids one in estimating the value of the data.

Cases showing Cough and Expectoration with no other symptoms.

Symptoms have persisted	1 month and under.	1 month to 2 mo's.	2 mo's to 3 mo's.	3 mo's to 6 mo's.	6 mo's to 12 mo's.	12 mo's to 2 years.	Over 2 years.	No data.	Total.
Negative	1	4	4	5	7	5	3	1	30
Positive	0	0	1	6	1	2	2	0	12
Percentage positive	0	0	20.0	54.5	12.5	28.5	40.0	0	28.5

The number of cases in the above table is hardly large enough to enable one to draw conclusions, but when one considers that only 42 out of 441 cases sent in, had merely the

the presence of cough and expectoration to direct the physician's attention to the possibility of phthisis, and yet twelve of these proved to be tuberculous upon microscopic examination, one is forced to the conclusion that, if phthisis is to be diagnosed in the early stages it is important not to wait until classical symptoms exist but to have a microscopic examination of every case in which persistent cough and expectoration does not yield to treatment.

Cases showing Cough and Expectoration with Pyrexia or Emaciation or Sweats, or all these Symptoms

Symptoms have persisted.	1 month and under.	1 month to 2 mo's.	2 mo's. to 3 mo's.	3 mo's. to 6 mo's.	6 mo's. to 12 mo's.	12 mo's. to 2 years.	Over 2 years.	No data.	Total.
Negative	19	23	9	35	27	5	13	3	134
Positive	3	14	10	22	27	8	2	1	87
Percentage positive	13.6	37.8	52.6	38.5	50.	61.5	13.3	25.0	39.3

This table does not require discussion. It shows from the number it includes the class of cases of which physicians are suspicious and upon which they require the further light of a microscopic examination of the sputum.

Cases showing Cough, Expectoration, Pyrexia or Emaciation, with physical signs of Disease of the Lungs.

Symptoms have persisted.	1 month and under.	1 month to 2 mo's.	2 mo's. to 3 mo's.	3 mo's. to 6 mo's.	6 mo's. to 12 mo's.	12 mo's. to 2 years.	Over 2 years.	No data.	Total.
Negative	8	8	10	10	11	4	4	0	55
Positive	4	7	8	12	8	6	3	1	49
Percentage positive	33.3	46.6	44.4	54.5	42.1	60.0	42.8	100	47.1

The numbers are unfortunately not very large in this table but it is interesting to note the much larger percentages of positive cases.

Cases showing Cough, Expectoration, physical signs with no Pyrexia or Emaciation.

Symptoms have persisted.	1 month and under.	1 month to 2 mo's.	2 mo's. to 3 mo's.	3 mo's. to 6 mo's.	6 mo's. to 12 mo's.	12 mo's. to 2 years.	Over 2 years.	No data.	Total.
Negative	0	1	2	5	5	2	4		19
Positive	0	1	2	3	4	1	1		12
Percentage positive	0	50.	50.	37.5	44.4	33.3	20.		

We finally have 26 cases in which Hæmoptysis was given as having occurred at some period of the disease. These cases are arranged in the following table :

Cases showing Hæmoptysis, with or without other symptoms.

Symptoms have persisted.	1 month and under.	1 month to 2 mo's.	2 mo's. to 3 mo's.	3 mo's. to 6 mo's.	6 mo's. to 12 mo's.	12 mo's. to 2 years.	Over 2 years.	No data.	Total.
Negative	2	0	1	2	6	1	2		14
Positive	1	1	1	3	3	1	1	1	12
Percentage positive	33.	100.	50.	60.	33.	50.	33.	100.	46.1

In 10.4 per cent. of the positive cases pain was given as a symptom, whilst it was present in only 6.9 per cent. of the negative cases.

In answer to the question as to exposure to infection, 28.4 per cent. of the positive cases gave such a history, whilst it was only present in 17.2 per cent. of the negative cases.

In considering the results given in the foregoing tables, the question naturally arises as to how far the negative results are reliable where the symptoms point to evident disease of the lungs persisting in some instance for a very long time. It is claimed for them that they are only reliable in so far as negative results can be after careful microscopic examination. In answering the physician the value of a negative result is pointed out and it is suggested that another specimen be sent if symptoms continue suspicious. It is remarkable, in how few cases second specimens have been sent, and in so far as histories have been obtained apparently the negative results have been largely confirmed. One physician wrote that all results during the preceding four years (some 25) were confirmed by the subsequent clinical histories.

It would be very strange, however, if a certain percentage of those reported negative were not tuberculous.

Another point of very great importance is brought out by an examination of the tables. That is the necessity of an early examination of the sputum. Thirty-one cases were diagnosed positively within the first two months of the disease, and when one remembers the great success in the treatment of such early cases by modern methods, the value of this result cannot be over-estimated.

Diphtheria. There were 375 swabs from suspected cases of diphtheria, examined during the year; 147 of these gave positive cultures of the diphtheria bacillus. With a large number of them cards were sent in, but very little of value can be extracted from them. The most interesting facts to be determined in these cases are the duration of the disease and the persistence of the bacillus after the disappearance of the membrane, and the effects of the use of antitoxin upon these conditions. All these data are asked for on the cards, but on account of absence of system on the part of physicians using the laboratory the returns are very incomplete. The majority of the physicians have been willing to use the laboratory for diagnosis, but have preferred not to do so in regard to release from quarantine. This is, of course, absurd, and demonstrates pretty conclusively that many physicians do not rightly understand the significance of the facilities offered them by the Provincial Board of Health. They seem to think that these facilities both in diphtheria and tuberculosis are simply to assist them in making a diagnosis. They may assist them in this, but their primary object is to protect the public health by making certain the diagnosis of two diseases which are a menace to the public health. In the case of diphtheria they fail in their duty if, after a positive diagnosis is made, they do not continue to send swabs until the throat is shown to be free from infection, and in connection with this the experience of all similar laboratories should be remembered, viz., that at least two negative examinations should be obtained before the throat is declared free of infection.

Typhoid. With the 164 specimens of typhoid blood there were only a small number of cards. From these the following data have been obtained. There were 33 cards from positive cases, and from these it was possible to determine approximately the day of the disease upon which the reaction was obtained :

On the 3rd day.....	1	On the 10th day.....	5
“ 4th “	1	“ 12th “	2
“ 5th “	5	“ 14th “	5
“ 7th “	10	After the 14th day.....	4

That is, that more than half of these positive reactions were obtained within the first week. It is probable that the others would have given similar results if they had been sent earlier.

Cerebro-Spinal Meningitis. An interesting feature of the laboratory work of the early part of the year was the receipt of four specimens from cases of suspected cerebro-spinal meningitis. The epidemic form of this disease is now known to be due to a specific organism called *diplococcus intracellularis meningitidis*. It differs from the *diplococcus* of pneumonia, which sometimes causes meningitis, in its staining, cultural and pathogenic characters, so that in material from the meninges it is usually possible without much difficulty to differentiate the two forms. The chief differences are as follows: By Gram's stain *diplococcus intracellularis* does

not stain, while diplococcus pneumoniae stains, it is more difficult to cultivate than the pneumococcus and dies out more rapidly in cultures, while the pneumococcus is very pathogenic for mice and rabbits, the diplococcus intracellularis is only slightly so.

The rapid death of the organism makes it difficult usually to get a culture, especially if the cerebro-spinal fluid has been allowed to stand any length of time after removal from the body. Even in fresh material, in which the microscope shows many organisms it is necessary to make several cultures as only a percentage of them show any growth. It is consequently hardly possible to hope for a positive diagnosis by culture with material sent to the laboratory from a distance, and the diagnosis would have to depend largely upon the negative cultural results and the staining peculiarities.

With the appearance of epidemics in various parts of this continent within the past year (notably in Boston, Baltimore and Philadelphia) it was of special interest to try and decide whether the Ontario cases were due to the organism of the epidemic form or to the diplococcus of pneumonia.

The first specimen was received March 20th. It was from a fatal case with an illness of about 48 hours. The specimen consisted of about 25 c.c. of bloody cerebro-spinal fluid, with a white sediment and containing white flocculi. On centrifuging it separated into a layer of reddish sediment with a clear blood-stained fluid above. A number of cultures were made from the material on different media, but they all remained sterile. Stained preparation showed that the sediment consisted of red blood corpuscles, polynuclear leucocytes and large mono-nuclear leucocytes. Certain of the polynuclear leucocytes contained diplococci somewhat flattened $1.0m \times 0.75m$ in pairs. These organisms did not take the Gram stain. Two grey mice were inoculated, one subcutaneously with $\frac{1}{2}$ c.c. of the fluid, the other intraperitoneally with $\frac{1}{4}$ c.c. of the same material. Both animals lived, the second showing slight illness for a day.

We had then in this case a purulent cerebro-spinal fluid containing intracellular diplococci, which did not take the Gram stain and which apparently were dead when received.

The presumption was that this case of cerebro-spinal meningitis was the epidemic form. Within a month three other specimens were received from the same county; but in no case could a positive diagnosis be made, although in one the same intracellular diplococci were found. In another only serum tubes, inoculated by the physician who made the *post-mortem*, were sent, and as they remained sterile nothing could be made out. In the other the specimen was badly packed and was broken before it reached the laboratory.

In recent epidemics of this disease the method of lumbar puncture has been extensively used as a means of diagnosis, and in some cases even as a therapeutic measure.

The puncture is made between the third and fourth lumbar vertebrae about one centimetre from the middle line, a large sterilized hypodermic needle being used detached from the syringe; the needle is pushed slowly upwards and inwards, the entrance of the point into the spinal canal being at once shown by the flow of cerebro-spinal fluid from the open end, sometimes under considerable pressure. Some of this is caught in a sterile tube, and a number of cultures at once made.

In fatal cases of cerebro-spinal meningitis this should be done if a *post-mortem* is not permitted, as a positive diagnosis can only be made by bacteriological examination.

It is important that physicians throughout the Province should recognize the importance of making as certain as possible the diagnosis in cases of this disease, since, if there is any danger of an epidemic, such as occurred in Boston, precautions should be taken.

DISEASES OF ANIMALS.

Rabies. During 1899 five specimens from cases of suspected rabies were sent into the laboratory.

May 3rd. The spinal cord of a sheep which had died of supposed rabies produced by the bite of a wandering dog. Two rabbits were inoculated but they remained unaffected, so that we must conclude that the case was not one of rabies.

July 11th. The head of a dog was received which was supposed to have died of rabies. One rabbit was inoculated subdurally with an emulsion of the medulla; fifteen days later it showed symptoms of paralytic rabies and died on the twentieth day.

Aug. 1st. The head of a cat supposed to have had rabies was received. One rabbit was inoculated subdurally but was unaffected by the inoculation, being well three months later. It was evident that this case was not rabies. Cultures from the brain of this cat gave negative results.

Aug. 26th. The head of a Newfoundland dog was received in the laboratory, also the cord of another dog and the cords of two cattle, all supposed to be cases of rabies. On account of the way in which the material was packed only the head of the dog could be used for inoculation. One rabbit was inoculated subdurally; this animal died seventeen days later, but unfortunately during my absence, and its symptoms were not observed nor was material kept for a second inoculation. These cases were probably true rabies, but on account of the doubt about the cause of death in the rabbit a positive opinion cannot be given.

Sept. 29. A fox terrier dog was brought to the laboratory supposed to have died of paralytic rabies. Two rabbits were inoculated subdurally with an emulsion from the medulla of this dog. The first animal showed symptoms of paralytic rabies seventeen days later and died on the nineteenth day; the second animal showed symptoms on the eighteenth day and died on the twentieth.

Of the five suspected cases two proved to be rabies, one was most probably rabies and the remaining two were not rabies. Of the three cases of rabies one was from Toronto and the other two were from the southern peninsula of Ontario, the district in which practically all our cases of rabies are found.

During the autumn and winter months there have been quite a large number of cases in Buffalo and the neighborhood, and it is rather surprising that we have not had cases from the Niagara peninsula due to importation. It would be well for Local Boards of Health along the main roads through the southern counties to keep a sharp lookout for suspicious animals.

Anthrax. July 27th. The spleens of two cows which died with symptoms and post mortem findings suggestive of anthrax were received in the laboratory from Mr. Burger, V.S., Listowel. Bacteriological examination of the material demonstrated the presence of the anthrax bacillus in both specimens.

Black Shoulder or Quarter Evil. November 15. Muscular tissue from an animal supposed to have died of anthrax was sent to the laboratory by Mr. Armstrong, V.S., Gorrie. Microscopic examination showed a bacillus somewhat like the anthrax bacillus. A guinea pig was inoculated subcutaneously with a little of the juice from the specimen. It died next day with the same bacillus observed in the specimen present in all the tissues. Aerobic cultures made from the original specimen and from the inoculated animal gave no growth of the bacillus seen in the tissues, but in anaerobic cultures it grew well; it was isolated and studied and proved to be *bacillus chauvii*, the cause of the disease, and usually called black shoulder or quarter evil. The absence of an aerobic pathogenic bacillus demonstrated the absence of anthrax. This case is of interest because it is the first one of this disease which has been diagnosed bacteriologically in the laboratory of the Board. It is apparently endemic in a number of districts in Ontario and it is important that outbreaks should be accurately diagnosed because of the fact that it is sometimes confused with true anthrax. True anthrax is a much more dangerous and fatal disease in animals and has this additional public health interest that it sometimes produces fatal infections in man.

BACTERIOLOGICAL EXAMINATION OF WATERS.

Throughout the year, in examining water samples bacteriologically, special attention has been paid to *bacillus coli* and colon-like forms; at the same time, of course, anything looking like the typhoid bacillus has been isolated and studied. In a number of instances *bacillus coli* has been found, but it is surprising that it is missed in waters where we would expect to find it. In every case it is absolutely necessary that the study of the particular organism should be carried out thoroughly, the amount of gas produced in fermentation measured and the percentage of relationship of CO_2 to H_2 established by Theobald Smith's method, before we can make a positive diagnosis of the presence of *bacillus coli*. As an example of the difficulty of establishing the presence of *bacillus coli* or *bacillus typhosus* in water I will detail an investigation into 21 samples of water

from the Indian Reserve in Tuscarora township, Brant county. The majority of the waters were more or less polluted. Cultures were made at 37° C by adding 1 c.c. of the sediment of each sample to 25 c.c. of bouillon growing for forty-eight hours and plating. All forms like bacillus coli or bacillus typhosus were isolated and studied. Thirteen colonies from as many different samples were isolated and marked typhoid-like, i.e., the surface colonies in the plates showed the leaf-like margin and veining characteristic of the typhoid colony. All these colonies were not equally typhoid-like, but they all bore a resemblance. Two of them proved on further culture to be liquefying fluorescent forms. Two proved to be nonliquefying spirilla. All the rest on further culture and replating failed to show a typical typhoid colony and none of them gave the agglutination test with undoubted typhoid blood.

Eight colonies were marked possibly colon-like; one proved to be a liquefying organism; five gave a negative indol reaction and did not ferment lactose; two only seemed to answer to the tests for *B. coli* in the fermentation tubes and both were quite pathogenic for guinea pigs.

Other forms of interest on account of their probable relations with bacillus coli were isolated from other samples of water, but lack of time prevented a systematic study of them.

With the view to studying the extent of the occurrence of the nitrifying organisms in wells and natural waters, some tests were made of samples received in the laboratory.

Investigations carried on by Jordon and Richards (Mass. State Board of Health Rep. 1890) seemed to indicate a wide spread distribution of these organisms in natural waters.

In my own experiments, 400 c.c. lots of a sterilizing Wnogradsky solution were placed in sterilized flasks and were inoculated with the samples of water by allowing them to sediment in the ice-chest and then drawing off 5 c.c. of the water with sediment in sterilized pipettes. In the first test one flask was inoculated from tap water, one flask from a public water supply derived from a brown river water, one flask from a well, not polluted; and a control flask was inoculated with soil. Examined from time to time the control showed progressive nitrification so that a month later there was only a slight trace of ammonia. The other three flasks showed no nitrification.

In a second test nine flasks of sterilized solution of a similar constitution were inoculated as follows: one as control from the previous earth culture, one from a public water supply from an underground source of known purity and seven from wells more or less polluted. A month later the first two flasks showed almost complete nitrification whilst the other seven showed no trace of it. The experiments would have to be carried out much farther to enable one to draw any conclusions, and it is hoped as time permits to continue the investigation.

In the chemical examination of the 29 samples of water sent in, the usual hygienic analysis was made, and there is nothing special to report in connection with them.

MISCELLANEOUS INVESTIGATIONS.

Among the miscellaneous investigations of the laboratory was a study of the character of a bacillus found in grass, which resembles the tubercle bacillus.

It was first described by Moeller as occurring in this situation, but apparently its first recognition was by Rabinowitch in butter. Its occurrence in butter has undoubtedly given rise to error, as it is apt to be reported as the bacillus of tuberculosis.

Its growth in culture media is not unlike that of the bacillus of tuberculosis except that it is much more luxuriant and rapid. It stains with ordinary tubercle stain, and in cover glass preparations looks so like the tubercle bacillus as to give rise to doubt in one not well acquainted with the true form. Inoculated in large doses in guinea-pigs, it gives rise to a disease of the nature of a pseudo-tuberculosis, small tubercles consisting of granulation tissue being found in the peritoneal cavity and liver. In smaller doses it gives rise to a slight indisposition and loss of weight with infiltration and tubercle formation at the point of inoculation and subsequent recovery.

It has not been described as producing a natural infection of cattle.

I found this organism present in several specimens of hay, and from one I succeeded in isolating it in pure culture. The resulting cultures showed the form to be identical

with Rabinowitch's butter bacillus, and animal experiments showed it to have a very slight degree of virulence.

I was able to show that its peculiar staining characters are due, as in the bacillus of tuberculosis, to a fatty envelope, but contrary to what occurs in bacillus of tuberculosis this fatty envelope can be readily dissolved off with alcohol so that after boiling for ten minutes in alcohol the organism no longer takes the peculiar stain, but stains like any other form.

Dorset, of Washington, has shown that Sudan III. is a stain for the tubercle bacillus on account of its affinity for fatty materials. My observation confirms this, but shows that Sudan III. will not stain the grass bacillus, the reason being apparently that the alcohol in which the dye is dissolved removes the fatty envelope before the dye can act.

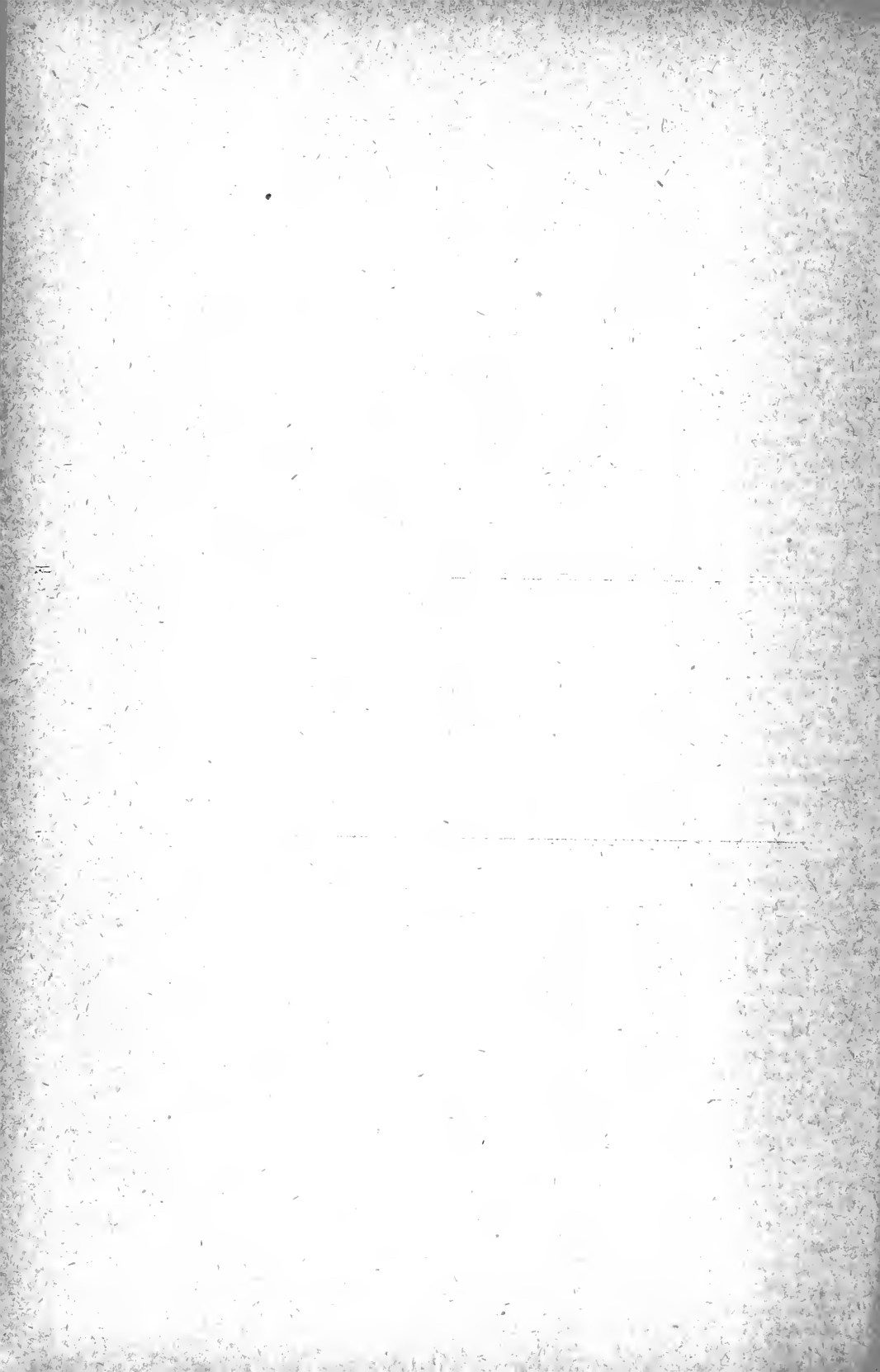
This organism shows, in culture especially in those in grass, a tendency to true branching which demonstrates its affinity with the streptothrix group. Another member of this group was isolated from a polluted barnyard well which did not show any resemblance to the bacillus of tuberculosis in its staining character, but which upon closer study showed a superficial resemblance to the branched diphtheria bacillus which has been described by some observers.

This streptothrix in early culture was quite characteristically branched, but as it continued to grow in culture media it developed a tendency to break up into short bacilli, very diphtheria-like when stained with Loeffler's methylen blue and the branching was lost. The organism was very slightly pathogenic for guinea pigs, producing a small abscess at the point of inoculation which was slowly absorbed, and efforts to increase its virulence by continuous passage have so far failed. The characters of this organism were embodied in a paper before the Bacteriological Committee of the American Public Health Association at its Minneapolis meeting.

The undoubtedly close relationships of the bacillus of tuberculosis and the bacillus of diphtheria with the streptothrix group make it important that all forms of this group should be carefully studied, especially in regard to their pathogenic manifestations.

The routine work of the laboratory has absolutely prevented the carrying out of any extended hygienic investigations, and this will continue to be the case until additions are made to the staff, the importance of which has been pointed out in previous reports.

PART II.



CHAIRMAN'S ANNUAL ADDRESS.

By DR. J. A. MACDONALD, HAMILTON.

TORONTO, 1st Feb'y, 1900.

GENTLEMEN,—It is once more my function to address you on the duties which have fallen to the lot of the Board during the year which has passed, and to bear testimony to the zeal of the brethren who compose the Board in the work which they have undertaken to perform. None have sought to evade their duties as members; as has been shown, not only by their regular attendance, but by the evidence which they afforded that the business of the Board and its usefulness had been the subjects of their study when at their homes.

The year has not been very eventful in the history of disease within the limits of the supervision of the Board. No destructive epidemic has visited us, but we have sufficient proof of the benefits of that sanitation of which this and other such boards are the custodian and caretakers. Smallpox has threatened in one or two districts under the guardianship of the Board. Our members know the history of that disease, its contagiousness and its infectiousness, the desolation which before the days of Jenner marked its course, and the terrible disfigurement which it left in those whom it failed to destroy. There are not many histories of mild epidemics of smallpox, but it has been reserved for our day to see one, and to what are we justified in attributing it? Must we not say that the alleviated form of the disease which has passed over certain parts of our land has been because of the small number of subjects who were unprotected by vaccination, so that the malady had not the opportunity of manifesting, as it were by multiplication, its old-time malignity. Much enquiry is going on, on the part of our more scientific brethren, as to the nature of the infectiousness of smallpox. May we not hope that the result of their studies may be, that the world may be saved from a repetition of the old smallpox history.

It is the honourable function of such public institutions as this Board to make clear to public comprehension the usefulness of such measures of disease prevention as active enquirers in this field of science may bring to light. We claim that by institutions, and among them by this, our own, much most serviceable knowledge is being spread among the people, and that thus this Board has been of much service to our Province of Ontario. The public is learning that it is worth while to be at trouble and expense for the purpose of sanitation, slowly perhaps, and not without opposition and detraction, but still it is learning the good arising from the work of the sanitarian, or arising from the existence of such a Board as this, because of the concentration of power on behalf of the public welfare which the functions of the Board mean. The occasions on which advice and help have been sought here have been numerous, and the members will bear witness that on no occasion have the seekers after instruction or assistance expressed themselves as being disappointed.

We are not to think, however, that the functions of the Board are to win the approbation of all men. Prevention of disease will be a long time before being easily made by general consent. There will always be many critics who think they know more than they have at any time taken the trouble to learn, and such individuals are always very positive of their knowingsness.

These observations have been thought to be timely because of the extraordinary re-action which, in these days, is much in evidence against the value of the discovery of Jenner—a re-action which seems to be gathering strength.

By reason of that discovery, and the nearly universal advantage taken of it for a century or more, smallpox had been nearly stamped out from among civilized people; and now many in their security seem to regard a belief in the history of that horrible disease as a superstition, and are doing what they can to cast discredit upon it. A man in authority in this city has delicately said that the operation of vaccination is beastly.

It is for this Board and other such boards to present their testimony against this cruel heresy, and to see to it that until some better preventive has been found against the hideous smallpox, the public be taught that no child of more than three months old should remain unvaccinated.

Much space has been taken up with this matter, but the anti-vaccination crusade is among the evils of the day. Looking forward to a remedy, may we not propose to the medical profession that it be made part of certain functions, which some assume as special, that the vaccination of the infant, within three months after birth, without charge therefor, be a necessary sequence to the greater function which shall have preceded. The medical profession, by such means, stamped out smallpox a hundred years ago. The Board, through its ever-active secretary, has had to deal practically with other evils than smallpox, and with other diseases, notably typhoid fever, of which the causes seem to be ever present, and against which incessant vigilance on the part of the sanitarian is needed. It is needless to refer to the bad habits of individuals or of communities as agencies in the production of this disease. Those habits exist and are likely to continue. It is for public institutions such as this Board to watch for the results of those habits, and to institute means for their correction, if that be possible, while the chief object may seem to be to indicate means for relief for their evil results.

It is my part now to say farewell and to thank the brethren who have constituted the Board for their considerate kindness. I trust I have never forgotten what has been due to them during my occupation of the chair, or during the time I had previously been a member of the Board, and I truly say that I shall always think with satisfaction of my association with them.

J. D. MACDONALD.

REPORT OF THE COMMITTEE ON EPIDEMICS.

1. QUARTERLY REPORT FOR THIRD QUARTER.

(By the Secretary.)

September 11th, 1899.

Mr. Chairman and Gentlemen:

The past quarter has been signalized in many parts of the Province by dry weather, though until August the Georgian Bay and Lake Huron district had an unusual rainfall. In the cities of the districts of Lake Ontario the dry weather has served greatly to prevent decomposition of organic matters, and the summer diarrhoeas of infants have been slight, the *bacillus enteridis* of Klein having no great facilities for development. With the added coolness and closing of the schools the prevalence of the acute contagious diseases has been but slight.

Owing to several deaths in Anderdon and North Colchester townships, in Essex, from diphtheria, I visited the district on July 14th, and found the small village of McGregor with still a number of cases. The people were mill hands, mostly with small houses, and owing to the mildness of many cases, no household isolation was being thoroughly maintained. Dr. Jenner, M. H. O., of North Colchester, having charge on one side of village, was doing what he could, in the absence of better means, to keep the people at home. The outbreak was, at last accounts, at an end.

In August, owing to the long continued presence of diphtheria and a notable number of deaths, I visited Hanover, in Bruce county, situated on the line of Bentinck and Brant townships. I found the secretary of the board of health of Bentinck, with the board, were active in isolating all cases, and the medical health officer of Bentinck unusually active. Owing to the class of population home remedies seem to have been generally tried before a physician was called, and later attendance of the cases was given up too soon, while patients were allowed to go to school before any swabs attested their throats clean, and disinfection by the local board was not supervised but only ordered. As but one family have the disease at present in Brant Township, it is hoped the outbreak will be completely ended; but a mortality of 13 in six months in a population not exceeding 4,000 must be looked upon as serious.

Smallpox.—The incidence of smallpox in spite of its prevalence in neighboring States has been slight. A case was introduced from New York State into Toronto, resulting in 3 cases in all with no deaths; while from Cleveland a case of supposed chickenpox was imported resulting in some 27 cases in all in Walkerville, Windsor and Sandwich East townships, with one death. The disease was of the remarkably mild type which has prevailed for two years throughout the United States, and presents from the stand-

point of the natural history of disease a most interesting study. The outbreak in this district has been treated as smallpox, cases were isolated in pest-houses and the disease is now at an end.

Hydrophobia.—The re-appearance of this disease has occurred in several districts in such a way as to again bring it forcibly to the attention of the Board. The laboratory report will deal with it more extensively ; but both as regards its prevention and treatment of persons attacked in Canada some comprehensive action is demanded.

Anthrax.—The outbreaks of this disease are becoming more frequent in this Province, and in the absence of any thorough action by the proper authorities, buried carcasses are continuing to create spots where its indemicity is being established. Introduced probably in every first instance by foreign hides or wool to the sole leather tanneries and woollen factories, it has extended to the flats along streams where their effluent waters flow. The latest cases have been on the stream below Listowel, where some 10 cattle in all have died this season. Others died last year, while the disease is reported to be endemic within a limited area of Ellice Township some 7 miles from Listowel.

Pollution of Streams.—In consequence of an outbreak of anthrax I visited Listowel early in August and found there had been cases of anthrax and an action pending by the owner of some cattle as against the town and owner of tannery for pollution of the stream. I examined the course of the stream, the position of the drainage from factories, houses, etc., and found that a main sewer can with a relatively small cost be conducted through the town which it is probable will be found capable of carrying the sewage without pumping to a point where a filtering plant can be established. The progressive character of the town demands such a measure.

As will be seen from correspondence, the question of stream pollution at Berlin and Waterloo by the town sewage has again been brought up. In consequence of complaints I visited Berlin in July, and with the engineer and chairman of the sewer commission inspected the sewage farm. Its condition was very similar to that found last year, an increased area is under cultivation with mangolds and the beds are rather better worked. The sewage discharging from the subsoil tiles was to the eye quite clear, and seemingly as pure as the main stream of the creek.

With several acres of land covered by the sewage which flows on to the flat beds to the depth of a foot or more, it is inevitable that a certain effluvium nuisance should be created. It was remarkably free, however, from this at time of my visit, though complained of by farmers in the neighborhood as having been oppressive on a damp still evening. Year by year however the soil of the farm is improving, and with an engineer having the matter in charge, the improvement will be still more rapid and scientific.

The complaints from Waterloo Township *re* the pollution of the Bridgeport creek have resulted in action being taken by the town authorities of Waterloo to compel connection with the main sewer by offending citizens.

Sarnia Oil refining nuisance. In correspondence submitted it will be seen that complaints were made to the Board that the refuse from the Sarnia oil refinery was polluting the St. Clair River, making it unfit for drinking water for residents along the river below. In consequence I visited the town and in company with Dr. Oliver the medical health officer, made an examination of the premises and methods of the company. It will be found of interest to the Board if a somewhat detailed report of this be submitted.

The works of the Imperial Oil Company are situated on twenty acres of ground, through which a small stream runs and empties into the St. Clair river. The following information was received from Mr. Stillman, the obliging superintendent in charge : When the present company took the works over there were four stills for refining crude oil in operation. Eleven stills have since been put in in 1899 already and eight more are being constructed. To these stills oil is pumped from probably 150 tanks, which are simply great cisterns dug in the clay and covered over tightly with iron plates. Some 60,000 bbls. of crude oil are refined in a single month and it is either brought in tanks or led in pipes to the tanks from the oil fields.

The crude oil goes to the first series of stills, where it leaves, after distillation, the heavy lubricating oils. From these the distillate is pumped to a series of other tanks from which, as refined, it is again pumped to the desulphurizing still, where it is treated by passing through a crude copper compound.

From there it flows to the refining stills to be again distilled and brought up to the flashing point 85°. Thereafter it is treated with sulphuric acid and soda ash.

The lighter gasses and naphtha are both distilled off from the crude stills; and thus with steam also given off are condensed and form the gasoline products.

From the heavy oils left in the crude stills are made paraffin, lubricating oil, axle grease, etc. From works of such extent it will be apparent that even the condensed steam from the stills will create a notable flow of oily water, but after the water for all the processes and boilers is considered the situation as described will be understood. Two pumps with 12 inch suction mains to the river are going all day, and 2,000,000 gallons of water are pumped daily. Thus it follows that at various points drains are seen discharging large volumes of water into the channel of the creek, always somewhat discolored by the crude oil or tarry products in suspension. These would and did formerly in fact flow into the river, but as all have an economic value it is the object of the operators to recover all of this overflow possible.

To this end what the refiners call a trap has been constructed, which simply means that an excavation in the channel and bank of the creek has been made in the clay and a large tank of planks is set therein and puddled about tightly with clay. This tank will be 85 feet long and 25 feet wide when completed, which was nearly the case at the time of our visit. The manager stated that it was during the time that the tank was being enlarged that a certain amount of refuse oil escaped down the river and which was the time the complaints were received. This large trap or tank is divided by planks into seven sections. As No. 1 fills with the oily water, the water is passing below into tank No. 2, the oily water always coming to the surface. By this means, the oils are practically all in a position to be re-pumped to the tanks since in the last tank very little black oil is seen on the surface. To catch the oil again the open mouth of an iron pipe, connected with the pump is set so as to pump of from the surface of the tanks, taking in oil and water.

All the effluent matter flows through a well over the mouth of the sewer leading to the St. Clair. In it nothing more was evident than the iridescence often seen on creeks where oils from swamps have accumulated.

Your secretary, while greatly interested in the details of the operation, and much pleased with the effectual means taken to recover the waste oil products, pointed out how necessary it was to prevent the pollution of the river as many settlers below had only the river water as their source of domestic supply, and suggested in case of further complaints that a further filtration be given the effluent by passing it over coke beds. The manager at once replied that they were most anxious to give no cause of complaint, and as they had ample coke from their own products they would gladly do this if any further complaints were made. When the extent of the daily output is considered the slight amount of oily substance escaping was very remarkable.

The gas works of the town were also visited owing to complaints made of pollution by their waste products. The works were in good condition but no attempt was being made to carefully collect the tarry products which pass over with the washing of the gas. A trap and if necessary filtration through a coke bed will remedy the evil complained of, the discharge being now into a shallow part of the bay, creating thereby an effluvium nuisance. Dr. Oliver agreed to notify the manager of the company to this effect.

Railway Cattleyard Nuisances.—As will be seen in correspondence, the summer months, as last year, have produced their large list of complaints regarding effluvium nuisances. Of this class the most troublesome this summer have been owing to the widely increasing commerce in hogs. The report found in pp. 65, 67, of the Annual report of 1898, states regards cattleyards, amongst the other causes:

"That owing to badly located cattleyards and stables as well as defective construction and the absence of means for cleaning, these materials, harmless at first in themselves, are allowed to accumulate and decomposition allowed to become productive of most serious nuisances."

The first investigation of complaint made by your secretary was a complaint of a hog-feeding establishment at Creemore, near Collingwood. Owing to complaints last year to me large drovers there who had splendid pens and facilities near the station, were forced with others to keep no droves of hogs for feeding in the village during the summer

months, but other pens in the town, usually with a few hogs, were allowed, and against one of the larger of these a neighbor made a very serious complaint. At the time of my visit not many hogs were kept and the nuisance was at a minimum. I pointed out in meeting with the local board that the remedy was not so much to deal with individual complaints as to prevent hogs being kept in the village at all, and on examination of their amendment to Schedule B. that their by-law as it then stood prohibited this at present, at any rate in summer. They had not understood this, as the amendment had been framed to deal with the drovers. I suggested they utilize its powers in dealing with those cases where complaints were made, but further correspondence shows that they immediately notified everyone by public notices not to keep pigs and summoned one offender when the magistrate dismissed the case by saying the by-law was not so intended. It is simply another illustration of the failure of our local health machinery.

Correspondence indicates the present state of the Dunnville, Paris and Forest railway cattle yard cases. Owing to the demand for an investigation into the cattleyards at Thamesville, under section 72 of the Act, I visited the town on Tuesday, Sept. 5th, and found the situation as set forth in the report herewith submitted. The same day I visited Chatham and sat with the Local Board of Health, which, as seen in the correspondence has had the same difficulty to contend with. I there learned that pressure from the local board had resulted in having drainage put in from the G.T.R. yards and appliances for flushing the floor. The inspector was instructed to see that arrangements are made for the systematic removal of manure after each day the yards are used, and that flushing of the floors be carried out at the same time. Forest town has not been heard from lately and it is assumed the action taken by the local board has been effective.

Pollution of Parkhill Creek.—On Sept. 7th your secretary visited Parkhill and met the local board of health to discuss a long-standing nuisance caused by the pollution of of the creek flowing through the town by Skinner's laundry. As will be seen by the correspondence submitted, an attempt was made to deal with the water last year and a crude tank with charcoal had been put in to intercept the soapy effluent. It was found to have been badly arranged and at time of my visit was not being used. A conference with the Reeve was had by your secretary and details of a plan were suggested by which a receiving tank and discharge tank were proposed, from which the effluent would be discharged to subsurface tiles laid in a neighboring lot. Compliance was promised and the local board agreed to give the principals a reasonable time to instal the new works.

Many other matters have been arranged by correspondence during the quarter.

All of which is respectfully submitted,

P. H. BRYCE, for the Committee.

2. FOURTH QUARTERLY REPORT OF THE COMMITTEE ON EPIDEMICS.

Nov. 17th, 1899.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN : Your Committee begs to report that with the exception of localized outbreaks, there has been no serious prevalence of contagious disease during the past quarter. As will have been noticed from the monthly statistical report published, there have been rather more deaths recorded from typhoid fever than during last year. The appearance of this disease has in most cases been in those parts of the Province, whether in towns or country places, where well-waters are still used ; and especially in sections where the long drought prevailed during the summer and permeable soils have lain above the water-table. The area of pollution seems to spread from privies and other collections of fecal matter year by year and the lower the water-level the more dangerous such pollution becomes. Such a condition is illustrated in places such as Brantford, Woodstock and Galt, and notably in rural localities, where the knowledge of such dangers and the manner of avoiding them progresses but slowly.

Your secretary investigated a quite serious outbreak in the village of Campbellford, where the condition already noted was well illustrated, excepting that the underlying

rock was very near the surface. The village is situated prettily on the river Trent, on the flat, and slopes of high hills on either side of the river valley. The limestone outcrops at places, and at others is covered with a shallow soil, water-soaked from the springs in the hill-side. Wells sunk in such places to the rock are shallow, and the movements of water from the higher grounds most invariably carry a grave pollution with it. Privies and other pollutions existed in some cases in close proximity to wells, which are veritable plague centres.

The town has a public water supply for fire purposes only, taken from the river below the town. With the water-power at command for pumping it would be a simple and inexpensive matter to lead water from pure spring supplies on the hill-side to a well, thence to be distributed over all the town. Here and there borings into the rock have likewise given a good water.

Such sources were strongly urged for adoption by your secretary and it is hoped a by-law will shortly be submitted for this purpose. It is the opinion of your Committee that the powers of the Board under the Act to insist on such a remedy when out-breaks of typhoid occur should be tested, as well as the power to compel local boards or councils to extend the water pipes to areas where the disease prevails from such causes, and thereafter to cause the closing of wells in such areas. There seems no doubt in the opinion of your Committees that the Act carries with it such powers in the same way as it does the construction of isolation hospitals in the case of smallpox and diphtheria.

Smallpox.—As the Board is aware smallpox of a mild type has appeared in an area of Essex county where cases had already appeared in June and August.

In consequence of reports of its prevalence reaching the Board, a medical inspector of the Board visited the district on November 8th and investigated the facts. These are set forth in the appended report of Dr. Hodgetts, Medical Inspector.

At the request of West Tilbury a physician was sent on the 11th to attend all cases; but as on his report measures in some of the municipalities for isolation of suspects were imperfect, and as quarantine was threatened by the authorities of D  t  roit whence the first cases of the disease came, it has been thought necessary to continue the inspection in the district, till satisfactory action on the part of the local authorities is reported.

General vaccination is reported as being proceeded with; and it is hoped that the disease will be promptly stamped out. Owing to the generally mild character of the disease your Committee would advise that a circular be prepared to send out to physicians setting forth the general symptoms and signs of this disease.

Diphtheria.—Owing to the general knowledge of the contagious character of this disease local authorities generally are active in its suppression. The imperfect results too often following their action are however due to a too early freeing of cases from quarantine. This has been the case in the instance of Paris, where the disease appeared early in the year; but practically disappeared during the summer holidays. Cases, however, appeared again early in October, as also cases of scarlatina; and in almost all outbreaks this failure to isolate for a sufficient length of time has been the cause of further cases.

It is expected that shortly an isolation hospital will be erected, when there is good reason to hope means will exist whereby its further extension will be prevented. A very serious menace to the public health further exists in some places, owing to the practice of the people, known as Christian Scientists, to not report cases of the disease occurring in their families. The danger is aggravated from the fact that public funerals may be held; and in one instance referred too in the correspondence, the anomaly occurs of no means existing whereby legal burial can take place. The matter calls for such legislative action as will define the position and duty of health authorities in such cases.

The laboratory of the Board is extending its facilities for the exact diagnosis of this disease; and it is to be hoped that local officers will insist on investigations of all cases suspected to have occurred, before burial is permitted. Some further assistance in the laboratory is however required to cope with the work which is constantly increasing and which cannot be promptly dealt with by a single officer.

Tuberculosis.—The monthly reports continue to note the prevalence of deaths from consumption, and the appalling fatality from this disease is once more shown in the Registrar-General's returns for 1898.

The total deaths recorded in 1897 caused by it were 3154, and from other contagious diseases 1763, and in 1898, 3291; while those from smallpox were 0; scarlatina, 222; diphtheria, 634; measles, 115; whooping-cough, 126; typhoid, 405, giving a total of 1,502. What this means may be judged from the following returns: 1891 gave for all six diseases, 2,656; tuberculosis, 2,379. 1892—for all six diseases, 2,764, and tuberculosis, 2,592

Your committee has again to ask, can nothing more be attempted, nothing done to prevent this enormous mortality from tuberculosis?

In May last an international congress met at Berlin to discuss this single disease.

Dr. Krieger dealt with occupations in their relations to the disease, illustrating this by the mortality in those living with and nursing consumptives; those leading sedentary lives and living in vitiated air, and those breathing irritating dust.

Dr. Büllinger, of Munich, showed the relations between tuberculosis in animals and the human subject. The identity of the disease in men and cattle and hogs was shown. Again it is stated that milk and its products from infected cattle are most to be dreaded. Its frequency in hogs was shown as being due to feeding infected milk, as also in children.

Prof. Flugge, of Breslau, with other pathologists, again set forth the fact, no longer admitting discussion *that the tubercle bacillus is the direct cause of all varieties of consumption in the human subject and also of bovine tuberculosis*

Prof. Frankel, of Halle, said every human being infected with tuberculosis and every infected animal were centres from which the disease is spread.

Dr. Roth, of Potsdam, Prof. Huebner, of Berlin, and Prof. Kirchner referred to the various means of its prevention; while Prof. Rubner spoke of how to prevent it in factories and dwellings of the poor. House and factory inspections were insisted upon so that over-crowding, imperfect ventilation and a dust-laden atmosphere might be prevented.

The great Prof. Virchow referred to the need of testing animals with tuberculin in order that milk from such might be prevented from being used.

Methods of treatment were dwelt upon and Curschmann of Leipzig, Kobert of Rostoch Brieger of Berlin, Sir Hermann Heber of London and Dettweiler of Falkenstein, all dwelt, upon the *open air* treatment. The general conclusion was arrived at that recovery can only be looked for *when the disease is attacked in its early stage*.

Sanatoria were discussed in all their bearings. Landesrath Meyer claimed that apart from the duties of governments and the efforts of charitable persons and societies, there was a special obligation on those likely to be benefited by the erection of sanatoria, as for instance large employers of labor and insurance societies.

In view of such a *resumé* of facts already known to your Board, your Committee would urge that the Board present these facts directly to the Government and Legislature and ask all health authorities and physicians to assist it in asking that provision be made whereby district sanatoria can be established in the Province.

3. FIRST QUARTERLY REPORT OF THE COMMITTEE ON EPIDEMICS.

Feb. 14th, 1900.

Mr. Chairman and Gentlemen:

You committee begs leave to report that the quarterly reports of deaths from contagious diseases for November, December and January continue to show the public health to be free from any great prevalence of fatal communicable diseases. It is further satisfactory to know that the annual report of the Registrar-General for 1898 just being issued, indicates another notable decline of deaths from these diseases. The total decrease over 1897 was for all diseases 1,263. This means a decline of 0.7 per 1,000, of which the decline in communicable diseases gave 22 per cent., or these diseases caused but 5 per cent. of death from all causes. The reduction in diphtheria alone was 342.

Smallpox.—As was reported at the last Board meeting in November in the statement of the Medical Inspector of the Board, smallpox had become prevalent in Essex county. Owing largely to the benign character of the disease, the work of your Inspec-

tor as well as that of the medical health officers of the district, proved most irksome owing to the difficulty in maintaining quarantine. After the first fright this disregard has always in certain communicable diseases proved a difficulty; persons most subject to panic at one moment, passing to rashness in the next. As may have been expected, these difficulties have made themselves felt to your secretary, who, as will be seen from correspondence, has been again and again called upon to take action in local disputes.

The following table presents a statement of outbreaks so far as reported :

<i>Essex.</i>		Cases.	Deaths.
Maidstone Tp	30	cases.....	None.
Rochester Tp.....	128	"	"
Helle River village	2	"	"
N. Tilbury Tp	26	"	"
W. Tilbury Tp.....	59	"	"
E. Tilbury Tp.....	2	"	"
<i>iddlesex.</i>			
Caradoc Tp.....	2	cases early diagnosis and vaccination.	Source, United States...No deaths.
<i>Lambton.</i>			
Sarnia Town.....	2	cases early diagnosis and vaccination.	Source, United States... "
<i>Frontenac.</i>			
(Sharbot Lake)	1	case, early diagnosis and vaccination.	"Source, not known,
		probably a tramp.....	"
<i>York.</i>			
Toronto Junction.....	19	cases.	Source, Freight R. R. Conductor..... "
Toronto	2	cases.	
<i>Brant.</i>			
Brantford	1	case, early diagnosis.	Source, Cleveland, U. S..... "

It will thus be seen that this Province has been the theatre in which a smallpox epidemic, as far as the experience of this Board extends during a period of 18 years, of an extent and persistency in mildness wholly unprecedented. The last report of the United States Main Hospital Service dealing with reports from different States, gives the following particulars for the six months ending January 26, 1900.

	Cases.	Deaths.
Alabama	4	..
Colorado.....	7	..
Georgia.....	60	..
Illinois.....	75	..
Louisiana.....	271	34
Massachusetts.....	2	2
Missouri.....	43	4
North Carolina.....	105	..
Ohio.....	55	..
Virginia.....	49	9

And some other states with a few cases.

It will thus be seen that many hundreds of cases of smallpox have occurred during these three months, and that, except in instances as that before noted in Prescott, Dundas and Leeds last year, and recently in New Orleans and Michigan, have had a virulence greatly below the normal.

It must not be forgotten that such mildness is not unusual. In 1894, for instance, during the great Chicago epidemic which extended to Detroit and thence to Ontario, causing 20 distinct outbreaks in six months, there were 35 cases and 4 deaths. In the Strathroy cases the remarkable fact occurred that the first person who had the disease had it in so mild a form that he was never sick, was seen by a doctor once, and then accidentally, and his disease was not diagnosed, and yet was the occasion of communicating it his room-mate, who recovered, yet gave it to a school-boy who died and whose father took it from him and also died.

But, nevertheless, the broad fact exists that to a hitherto unknown extent, the persistency of the mildness has been so great that physicians and health boards are being put in difficult and delicate positions, first to know what the disease is, and second to perform their duty to the public. To know that this has occurred to hundreds of physicians in the United States, does not make the task less irksome here.

Your Committee speaking with whatever light the experience of 18 years of continuous dealing with outbreaks and epidemics can give, realizing that this Board under the general statute is required to take such action as the circumstances demand for preventing the spread of communicable disease, desires to set forth such facts regard-

ing the disease as will enable the Board and public to accurately estimate the situation as it exists. To this end it proposes to ask and answer the following questions :

"Is the disease we are dealing with smallpox?"

While this is the primary question, there are others subsidiary of great importance. Let us apply the tests.

1st. *As to its contagiousness.* That this is extreme has been illustrated by the present Toronto Junction cases, accounts of which have filled the papers for a week past. From one case admittedly mild, not isolated, at least 18 adult persons exposed directly to him have taken the disease within the usual incubation period of from 12 to 15 days.

2nd. *Is it Chickenpox?*—While speaking generally, all text-book authorities state that chickenpox practically never attacks adults, yet your Committee is personally convinced that instances do occur; but they are equally certain that no authority and the experience of no expert has ever known one mild case of it to have caused healthy adults in succession to become inoculated, some of them after but a single temporary exposure.

3rd. *What class of persons are attacked?* Not only were adults attacked, but it happens that at least the first six cases seen personally by a member of your Committee, were all persons who had never been vaccinated. In the outbreak in Essex the report of Dr. Bryans on 11 families with 85 inmates seen during a period of two months, every detail of whose history became his study, illustrates exactly the same fact; and similarly in the cases of Walkerville and Windsor, seen by two experts, the medical officers of those exposed towns.

4th. *What persons were not attacked?* The persons who were not attacked were practically in every instance, persons who had had smallpox, (See Bryan's report of West Tilbury, also recall the fact reported that a person in the boarding-house at Toronto Junction who has had smallpox and who is quarantined therein, has been employed as a nurse for the men, being referred to as an immune) or persons who have well-defined old vaccine marks. The Essex cases again show that imperfect or nearly obliterated marks or recent imperfect vaccinations failed to protect. If persons were vaccinated with potent virus within a day or two after exposure, the usual experience was obtained, that the vaccine having a more rapid course became an absolute protection and smallpox did not occur.

5th. *Could it be any disease but Smallpox?* This question to every physician, is answered by the previous statements; but we may state further, that in all the cases at Toronto Junction recently seen, (a) Notable preceding malaise occurred with an attack ushered in with pain in the back, head, vomiting, chills and fever; (b) the subsidence within 48 hours of fever with the sense of wellness for a day or two, then followed by (c) the secondary rash progressing for the usual four or five day period to complete maturation, ending in cases seen by your secretary in umbilicated pustules, in two or three patients becoming confluent, and others semi-confluent. It had taken 8 to 10 days from its onset for the disease to arrive at this stage. Chickenpox does not usually become pustular, while the rash follows the onset of the disease within 24 hours; there is no secondary rash, and the successive crops of the first have matured usually within 48 hours.

Measles plays no part similar to this and no other disease we know enters into the question, and none but smallpox will fulfil the conditions.

6th. *Biology of the Disease.* We are aware that it is not safe to dogmatize in matters not capable of scientific proof; but in respect of the attenuated virulence of any zymotic or germ disease we are no longer in ignorance, though in some particulars our knowledge is still incomplete. Thus we know that in cholera, bubonic plague, scarlatina, diphtheria, etc., in those climates where any of them are endemic, it is the invariable experience that different outbreaks vary in virulence from the benign to the most malignant while the same outbreak may exhibit in different patients the several stages of severity. The biological reasons worked out in most of these diseases are, (a) *an inherent difference in type caused by the environment of the germ*, whether in the particular individual or in some instances its existence external to the body. This may be due to climate, season, or presence in the system of the patients of other antagonizing or assisting microbes or conditions. This condition seems to have actually been demonstrated in the production of vaccine virus, which according to Crepeland and the biologists of the Paris Vaccine Institute, is but a modified bacillus of smallpox.

(b). *The resistance of the vital powers of the individual to the germ of any particular type.* This varies with the constitution, the temporary state of health, the age of the individual, as where the adult seldom takes chickenpox or scarlatina etc., etc. This fact is of much importance, since if the germ though primarily benign, invades the person with small resistance or in bad environment the rapid succession of generations of the germ may, and indeed often does, cause them to attain a virulence, as when a virulent pus germ is present in the smallpox vesicle lessening the cell resistance, or when the disease develops under filthy conditions, when it will have developed a new race of germs, which, if finding such unsanitary conditions perpetuated, will become as it were the permanent type—during it may be a wide-spread outbreak.

(c) *With this is usually set down by the bacteriologist the amount of the dose.* In other words, the number of germs that an individual may become inoculated with.

Thus we must, from the biological standpoint, accept the position that by any one of these several tracks the present outbreak of smallpox may attain a gradual or sudden virulence which would demand the most heroic measures for its suppression. That this may take place at any moment is proved in the two distinct outbreaks in January and February, 1899—one the Prescott case and the other the Leeds or Wolford cases; and within the last month in the Louisiana cases.

7th. *What attitude must this Board assume towards the disease?* Your Committee would recall the diagram in last year's report of smallpox deaths in Ontario for thirty years. The Board knows what this means; the records of municipal and governmental expenditure show what it means. Except in one year—1894—in the decade preceding 1899 the Province had not a single death from smallpox since 1889. Except in 1894 and in isolated municipalities in other years, the Provincial Board is aware, the local boards know and the public as individuals are cognizant of the fact that vaccination has been practically neglected by the people of Ontario during this period. A younger population exists to-day practically unprotected.

Bubonic Plague. Your Committee would bring to the Board's notice the fact that for the first time in history the *bubonic plague* has invaded the western hemisphere and that the epidemic since its appearance in China in 1893 has been slowly but surely extending.

A summary of the chief facts regarding it is due the public, with a view to prevent alarm by enabling it to understand the character and mode of spread of the disease.

It has within the period of history ravaged from time to time Europe, Asia and Africa. During the present epidemic its true nature as a germ disease has been disclosed, and many epidemics are referred to by writers before the Christian era, but that of the 14th century is best known to us. It is estimated that one fourth of the population of Europe, or 25,000,000, died in the several epidemics of that century. The present plague appeared in Hong Kong in 1893, thence by ships was carried to Bombay, Poonah and other parts of India by ships; thence by the Red Sea in 1899 to Alexandria and to Portugal. Eastward it has spread slowly to Japan and Formosa during the past year, causing 2468 cases in Japan, and 1866 deaths in Formosa, and thence to Honolulu in 1899, where it is still present. From Oporto, where it appeared as usual among ship laborers, it has spread to Santos in Brazil.

What it means in India or to a similar population, is seen in the statement of the last statistics that there have been in Bombay presidency 220,907 cases, and 164,000 deaths.

During the last 50 years, in 30 of which it has been recorded in some Asiatic country its most northern limit was in Astrakan, Lat. 45°, but it has been present in Britain and Sweden in previous centuries.

Its present interest for us is the constant and increasing traffic between British Columbia and the far east; the fact of a crowded Chinese quarter in Victoria, and the fact that the disease being in Brazil, as usual in the shipping quarter, it may naturally progress towards northern sea-ports if not carefully guarded. In proof of this the British ship *J. W. Taylor* arrived in New York on 18th Nov. 1899, with two cases on board, having also lost one man at sea from the disease. The ship came from Santos. Prompt measures were taken and it did not extend. The cases at Honolulu are reported to have been largely suppressed.

As already stated it is a germ disease, first discovered by a pupil of Prof. Koch, Dr. Kitasato and his assistants, sent by Japan to study it in Hong Kong.

It is essentially due to inoculation and occasionally to inhalation of the germ into the lungs or into the stomach. Dr. Simon a pupil of the Pasteur school has apparently definitely explained its inoculation by the medium of fleas in the houses of the poor, these having previously been parasites on rats, which in all the epidemics seem to have died often in great numbers, often before the human outbreak occurred.

It is a febrile disease in which the poison has been carried from the point of inoculation, as the bite of a flea, along the lymphatic vessels and results in buboes or pustules at one or several points, while head symptoms are prominent in severe cases. Some are slight cases or ambulant cases; some are pulmonary cases, and seen, when the type is virulent, ending in a general septic state, and often fatal within 48 hours. In very severe cases hemorrhages under the skin and mucous membranes occur, and buboes may not have time to form before death supervenes. This is "the Black Death" of the older centuries.

As may be expected the multiplication of the bacilli produce by-products or *toxins* in the blood, and Yersin of the Pasteur Institute has discovered also their antitoxin. The bacilli will exist for at least 15 days and probably grow external to the body in organic matters as of streets, lanes, houses if protected against sunlight and desiccation. It is readily killed below 212° F. and in solutions of germicides.

The antitoxin is obtained from healthy horses in a manner similar to that for diphtheria, herbivores not being readily susceptible to the disease.

Isolation for a month after apparent recovery is advocated by Kitasato, as the germs may still linger in clothes, etc. Disinfection and cleanliness as for other diseases is essential; while house-to-house inspection, closing up or burning dwellings unfit for habitation, and a crusade against rats, is a routine measure.

Essentially for the present must we look for the protection of our sea-ports by the Quarantine authorities and by community of action between health authorities, wherever danger appears.

The immunity of inoculation against it with the serum lasts a fortnight, and requires to be repeated if danger is present. Protection to the extent of 85 per cent. with Haffkine's protective vaccine is got with one inoculation and complete after a second or third inoculation.

This is rather a vaccination with a toxin than a protection with an antitoxin.

The incubation period of the disease is 24 to 72 hours.

The regulations of the Marine Hospital Service, U.S., are published in the report for Jan. 26th, 1900, and state:

1st. That passengers should not be vaccinated against the plague on shipboard, as it may confuse diagnosis at port of arrival.

2nd. Baggage from infected ports must be disinfected at port of arrival.

3rd. Passengers from infected ports should be detained 15 days before embarkation, or if not must be detained at port of arrival.

4th. Passenger ships on arrival at port must not be given *pratique*, but must be lightered and cargo disinfected.

5th. Animals should not be shipped from infected ports.

All of which is respectfully submitted,

P. H. BRYOE.

J. J. CASSIDY.

REPORT ON SMALLPOX OUTBREAK IN ESSEX CO., PRESCOTT, STORMONT AND LEEDS IN JAN. AND FEB., 1899.

BY CHAS. A. HODGETTS, M.D., MEDICAL INSPECTOR PROVINCIAL BOARD OF HEALTH.

TORONTO, June 28th, 1899.

Peter H. Bryce, Esq., M.A., M.D., Secretary Provincial Board of Health:

SIR,—Acting under instructions of January 28th, last, I proceeded forthwith to the districts in the eastern portion of the Province as Inspector and continued the duties of the office for a period of four weeks.

The districts visited and in which smallpox was found to exist were :

GROUP I.—East Hawkesbury Tp., Chute à Blondeau, Vankleek Hill, Osnabrook Tp., Williamsburg Tp., Cornwall.

GROUP II.—Wolford Township.

The local authorities of the municipalities adjoining these infected districts were visited for the purpose of either initiating or furthering compulsory vaccination, and the work of vaccinating the employees on the public works in the vicinity of Iroquois and Cardinal was materially aided.

The appearance of cases of smallpox in the different municipalities at about the same date, together with the report that in some sections the local authorities had not acted promptly, made the outbreak assume a somewhat alarming character and which looked more serious still in one instance where the cases happened among men employed on the public works then in progress. Although this was the case, I am pleased to report that as a result of effectual quarantine, perfect isolation and prompt vaccination not a single case has occurred outside the suspects who by diligent search were found out and quarantined.

The fact is to be regretted, however, that, owing to imperfect quarantine placed over the house in Osnabrook township, near Farran's Point, seven persons who had been exposed escaped. They were all subsequently quarantined, and only in one instance was the disease spread, the man having gone to Waltham, Pontiac Co., in the Province of Quebec, where he and others were ill with the disease. It might be added that six of the men left the house before my arrival in the district, and the last left just after my inspection of the district and notification of his leaving did not reach me for some days after.

In the municipality of East Hawkesbury, where the disease happened entirely in French-Canadian families, the local authorities, having, from causes best known to themselves, failed to appoint a medical health officer were without an executive head when the first case was reported, and consequently were slow to inaugurate any measures either of a preventive or curative character ; as a result, the disease became more widespread than in other municipalities, and consequently the expense much greater than it would have been had the provisions of the Health Act been followed out.

In the township of Osnabrook the chief executive officer did not act as promptly as the urgency of the case demanded, as he wished first to place liability of costs upon the Provincial Board of Health, seemingly overlooking the fact that his first duty was to enforce the law and prevent the spread of the disease, leaving the question of cost to be settled after as between the Provincial and local authorities.

As the result of the adoption of efficient measures in a prompt manner, and in striking contrast to the methods adopted in these two municipalities, should be noted the action of the local boards of health of Cornwall, Vankleek Hill, Williamsburg and Wolford townships, where the disease was kept within the limits of the premises where it first appeared, materially lessening the cost.

Origin of Outbreaks.—Group I.—A party was held on New Year's eve at the house of Louis Desjardines, there being present several parties from Oteau, in the Province of Quebec, where smallpox already existed. On January 14th, the daughter, Victoria, was taken ill whilst working at the house of Mr. Kirby ; she was subsequently sent home (21st) January, was seen by Dr. Lynch on 25th, and who immediately notified the reeve.

On January 13th an infant of Louis Desjardines, aged 5 months, who had with its mother been present at the aforesaid party, was taken ill at Vankleek Hill while on a visit to that place. The case was diagnosed as one of chicken-pox, was permitted to leave the house of the Durocher family and returned with the parent to Chute à Blondeau, where it died just previous to my arrival there.

The first case in the Durochers' family was January 28th, which was reported to the M. H. O. by the same physician who announced the supposed case of chicken-pox.

The cases in Chute à Blondeau and East Hawkesbury either had their origin from Mr. Kirby's house, from which the Desjardines patient was removed, or from the patient after her removal home to the village and before the character of the disease was known.

From East Hawkesbury the disease was carried to the Whiting house in Osnabrook township, near Farran's Point, by some workmen who had been at the party in Desjardines house, and who remained in the township for some little time after ; in this

house the first case happening in Williamsburg township and that reported from Cornwall had their origin.

East Hawkesbury and Chute à Blondeau.—The first case happened here January 15th and the second February 1st, just previous to the date of my inspection of the district. During the time intervening between these two dates practically nothing had been done by the local authorities. The first patient was taken ill while working at the house of the reeve and was removed from there to her home in Chute à Blondeau January 21st, and so far as could be ascertained it was not pronounced as smallpox until Jan. 25th, when she was seen by a local practitioner for the first time. He at once notified the local authorities. It was not until after conferences with both the local board and council that measures were adopted of a character to restore confidence and place beyond doubt the belief that the spread of the disease would be checked. That the measures adopted at this time were adequate to cope with the outbreak has been proved beyond a doubt by the results, for but few cases happened outside the houses I had placed under quarantine. This fact is worthy of more than passing notice, as it was stated in the public press, on official authority of the Health Inspector of the Province of Quebec, after a hurried trip made by him to the district, that the measures just referred to were "inefficient, etc." Whilst not questioning the right of the Quebec official to visit the infected district, yet I do think it would have been much better for him to have conferred with your officer before making public such a damaging and alarming statement, for which there was not the least tittle of truthful evidence.

When once the authorities of East Hawkesbury had been assisted to put the necessary sanitary measures in operation, they acted with commendable energy.

Vankleek Hill.—The first case reported in this municipality was Jan. 28th, although an infant, (the one mentioned previously) was taken ill Jan. 13th with what was supposed to be chickenpox. At the time of my arrival the local authorities had adopted measures of quarantine but had made no arrangement for the medical care of the cases, the M. H. O. Dr. McKinnon, being temporarily in charge; he however, subsequently assumed sole charge together with the cases in East Hawkesbury.

Osnabrook Township, (near Farren's Point).—Here again there was a failure on the part of some of the local authorities to act promptly owing to reasons local in character. The disease broke out in the Whitney house, wherein boarded some of the men employed on the public works close by, and the escape of seven of these men made affairs look grave for a time. The local board of health when once informed as to the measures to be adopted, acted in a most commendable manner. The Whitney house, being roomy, was used as a hospital and a pavilion was erected for the quarantined, efficient police put in charge and Dr. Jameson engaged to attend the cases jointly with those in the adjoining township.

Williamsburg Township.—The four cases here were in the same household. The house was in an isolated position. The local board acted with commendable promptitude and adopted every measure suggested for the handling of the disease.

Cornwall.—Although the case happened on First St., close to the business portion of town, yet the prompt and efficient means adopted by the town of which Dr. Alguire is mayor, resulted in a manner most gratifying to all.

Group II.—*Wolford Township.*—The origin of the disease here will forever remain a mystery.

The work of the local board was prompt and efficient, no pains being spared to provide for the patients. The disease was confined to the house where it first appeared.

Vaccination.—In municipalities where the disease existed, compulsory vaccination was the rule, and in all adjoining municipalities it was ordered to be enforced and as a result thousands of primary vaccinations were made.

Assistance was given the authorities in those sections where the public works were in operation on the St. Lawrence and I am pleased to note the ready assistance given by the several contractors whereby the work was greatly facilitated.

The use for the first time, to any considerable extent, of "glycerinated lymph" is excuse for comparing the result with that following the use of points. I found that while its use seemed at first a little tedious and the absorption of prepared lymph slower,

yet the development subsequently of the typical vesicle with the accompanying constitutional disturbance, were as a rule, so markedly free from those unpleasant symptoms we so often see and which is to be feared have made the general public look with some feelings of dread on this most useful and efficient preventative operation, that I cannot but speak with approval of the preparation and recommend its more general use.

Appendix A is the tabulated report of the medical men in attendance on the case.

In group I. there were 30 cases, 10 male and 20 female, with 4 deaths among each class. 8 males and 18 females had never been vaccinated. 16 had been vaccinated after exposure but in most cases the disease appeared shortly after resorting to this preventative measure making it impossible to judge of its efficacy.

In group II. there were 6 cases, 2 male, 4 female, with 2 deaths, 1 male and 1 female, 2 males had never been vaccinated and 3 females.

Before closing I would note the uniform kindness with which the local health officers and boards everywhere received me and the cordial co-operation always evinced, thus showing a desire to carry out the Health Act in conformity to the wishes of the Minister of the Department. All of which is respectfully submitted.

CHAS. A. HODGETTS, M. D , L.R.C.P. London, England.

VI.—REPORT ON THE OUTBREAK OF SMALLPOX IN ESSEX COUNTY.

By C. A. HODGETTS, M.D., MEDICAL INSPECTOR.

Feb. 15th, 1900.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—I have the honor to submit the following report of my work as Provincial Medical Health Inspector in the counties of Essex and Kent, for the period from Nov. 7th to Dec. 23rd, 1899, during the prevalence of smallpox, chiefly in the former county.

In company with Dr. Briens, Essex, and Dr. Millen, Maidstone, M.H.O., I visited a patient in the house of Mr. Stowe, Maidstone township, in November. This case had been first seen by Dr. Briens and pronounced by him one of smallpox and so reported to the local authorities ; his diagnosis having been doubted by them, he promptly notified the Provincial Board of Health of the facts. From the history given and the appearance of patient at the time of the consultation I agreed with Dr. Briens and pronounced the case one of smallpox, and forthwith instructed the M.H.O., in his duties as to the strict quarantining of the household by the aid of competent and trustworthy sanitary police, the ordering of compulsory vaccination by the council, and the providing of proper medical attendance on the case.

Although this was the only case which had been reported to your Board, I came to the conclusion that there were many other cases scattered throughout the adjoining townships of Rochester, North Tilbury and West Tilbury, and forthwith proceeded in company with Dr. Briens to examine other houses, acting with Dr. Amyot, M.H.O., Rochester ; Dr. Anderson, M.H.O., Belle River, and Dr. Anderson, M.H.O., West Tilbury, in their several municipalities, with the result that I found 23 other cases in the townships of Rochester, North and West Tilbury, and the village of Belle River. In this latter municipality the case was under partial quarantine,—the house being placarded as "Infectious Disease," but in the townships no precautions whatever were taken.

In the case of the municipality of Rochester, which had been informed by their M.H.O. some two weeks before my inspection that a case of smallpox existed in the township and that he had quarantined and placarded the house, the action of the board of health was in my opinion most blameworthy,—ignoring their M.H.O. they called in two local physicians, and upon their pronouncing it "chickenpox," raised the quarantine. It was my good fortune to meet the members of this Board when I told them of the character of the disease, and instructed them as to the proper measures to take for stamping it out, but they treated the matter very lightly and indifferently, relying on the diagnosis of the two local physicians.

To the lack of prompt action on the part of the medical health officer as well as to that of the local board, is in my opinion largely due the fact that most of the subsequent cases happened in this municipality. Had an appeal been made by either the medical health officer or the board of Rochester, to your Board a much more satisfactory report could have been made.

Upon ascertaining the nature and extent of the outbreak I at once informed the local health officers and secretaries of the facts, and ordered compulsory vaccination, quarantining of infected houses by efficient police patrol, and the employment of medical attendance for the cases.

The appearance of the rash, was in most of the cases seen at the time of my first inspection, of such a typical character that I had no hesitation in making the diagnosis of smallpox,—indeed in all the 24 cases that I then saw, even in the mildest there was sufficient to warrant isolation by the local authorities as suspicious cases, and quarantining the houses until further developments.

That the disease was mild in character there can be no doubt, as there have been to this date 218 cases with but one death.

That it is either modified or prevented by vaccination—recent or remote, is a fact proved frequently during the progress of the outbreak.

That those who had previously had smallpox were immune was demonstrated in five cases to my personal knowledge.

That the period of incubation was the same as the more serious forms of the smallpox has in nearly every fresh family attacked been proved, on investigation; and only prevarication on the part of members of the infected households has prevented me ascertaining it in every case.

The difficulties surrounding this outbreak were chiefly:

The wide spread character of the outbreak before preventative means were adopted.

(a) The mild character of the disease.

(b) The appearance of chickenpox in adjoining municipalities—among English families.

(c) The ready discussion of the subject in the public press by medical and other experts and the Medical Health Officer of Detroit, who had never seen one of the cases.

(d) The aversion of some French Canadians to vaccination and their suppression of information and concealing of cases.

With any of these difficulties in the way the suppression of the outbreak must take some time, but with all of them to face it seemed a task most hopeless, but one by one they were met, and with the co-operation of the three medical men who attended the cases and the medical health officers of the municipalities I am pleased to report that at the date of my leaving the district, Dec. 23rd, 1899, although there had been reported 218 cases in fifty five houses, yet 109 of these had recovered, leaving 109 in 29 houses—many of whom would be free from quarantine before January 1st, 1900.

Before concluding I would refer briefly to the fact that it was found that much of the glycerinated lymph used in this outbreak failed to produce the typical vaccine reaction and as a consequence much of the vaccination had to be done over again. The reason for this unfortunate result seems to be due to some fault in the product itself and not to any method of procedure in the operation of vaccination.

Respectfully submitted,

CHAS. A. HODGETTS, M.D., L.R.C.P., London, England.

Medical Inspector.

History of outbreak. On July 1st, 1899, the daughter and granddaughter of Guilbeault, town line, North Tilbury, visited at the house of a French family near Walkerville and returned home about July 6th, 1899. About ten days after the return the grandchild was taken ill. A doctor pronounced it chickenpox and it spread to the rest of the family except those who had had smallpox before, thence across the road to the house of one Lajeunesse, Rochester township, and the family of Logan in the next lot north. It seemed to smoulder in these houses during the months August and September, as the members of the families bore testimony to their having had the disease.

This is previous to the disease being known to exist.

A young man who was suffering from the disease with the eruption well out attended a dance at the house of Tellier about the middle of October and all the cases I saw at the time of my first inspection had come in contact either at the dance or some other place with this man.

REPORT OF THE COMMITTEE ON THE CAUSE AND PREVENTION OF CONTAGIOUS DISEASES (OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.)

READ BY P. H. BRYCE, M.D.

October 31st, 1899.

Mr. President and Gentlemen of the Association :

Your committee begs leave to report that during the past year it has endeavored to keep in touch with the reports of progress which have been made in the elucidation of the causes of the several communicable diseases which are of practical interest and importance to those whose duties call upon them to take action with regard to them.

The limits of this report make it imperative to confine our remarks to those points which, in the evolution of scientific medicine illustrate some new phase of disease or demonstrate some new fact whether it be the causation of some disease hitherto unknown, or the prevention of some malady, which is now regarded as preventable.

Smallpox—The past year has once more brought prominently to the attention of all officers of health the fact that this disease, fortunately so long quiescent, only requires an opportunity to become disseminated with all its pristine readiness, if not with its old time virulence. Certain areas of the continent have the disease prevailing to a very serious degree, and health authorities have experienced in many instances great difficulties in preventing its spread. One very important reason for this has existed in the remarkable variation in virulence, which has marked the disease in many instances. Thousands of cases have occurred within the year in the United States with a mortality not exceeding five per cent. The explanations from the biological standpoint of this would prove of extreme interest were we in possession of them ; but owing to the great difficulties which have been experienced in cultivating the microbe of the disease, almost nothing has been established. We would seem to have to fall back on the old theory of acclimatization, or failing this the supposition that the habits of life of the people along with climate, have prove inimical to the development of virulence in the germ of smallpox. It has been a general observation that the virulence of the disease is notably less in sub-tropical than in temperate climates ; but we have witnessed during the past year a winter of remarkable severity, incapable developing the usual virulence of the disease, except in a few instances. That the disease may at any moment become malignant was, however, seen in the Province of Ontario, where out of 36 cases, originating it is believed in a case from Cleveland, 11 deaths occurred.

That there are biological conditions in the individual, influencing the development of virulence in the microbe, may legitimately be concluded from the extremely valuable experimental observations made at the Institute of Animal Vaccine, Paris, by Bédère and Chambon.

The experiments were made with the object of determining the effect upon vaccine lymph produced from vesicles in vaccinated animals previously treated by means of hypodermic inoculation with the virus. A very notable reduction in virulence was the result ; while similar results were obtained in animals, inoculated subsequent to an injection of blood serum from vaccinated animals, as horses and cattle, and from men and monkeys suffering from smallpox.

The conclusions briefly summed up, were :

1st. The serum of a heifer taken fourteen days after inoculation is endowed not only with immunizing properties, preventive and curative, but it also produces when mixed with vaccine, an anti-virulent effect.

2nd. It produces in horses and probably other animals, the same anti-virulent properties as in cows and man.

3rd. Vaccination produces the anti-virulent property on the serum, however, the inoculation be made, whether by the skin, the blood, or the deeper tissues.

4th. The serum from convalescents from smallpox exerts the same anti-virulent action on vaccine as that from variolized animals, as monkeys.

5th. The anti-virulent substance of the serum of man and animals immunized against vaccine and variola has a stable composition, offers great resistance to heat, light, time, persists when dried and does not readily putrefy.

6th. The blood takes several days after inoculation to acquire anti-virulent properties fully; in the heifer after from nine to thirteen days, and is at the very moment that the vaccine or variolous virus loses all activity.

7th. The period of vaccinal immunity varies much with different species, but the anti-virulent property of the blood goes on increasing, and may disappear completely, although the skin in the same person may still resist re-inoculation with vaccine.

8th. The anti-virulent property varies with different persons, but persists for twenty-five years, and even fifty or over, with persons against variolous and vaccinal infection.

9th. The production of the anti-virulent substance in the course of vaccinal or variolous infection, and its appearance in the blood plasma, constitute a reaction of defence of the organism intimately allied to the arrest of the morbid process, and to the development of immunity. We do not yet know whether this substance acts directly on the infective agents as a virulicide or whether it acts as a stimulant on the tissue cells of the organism.

The practical diagnostic difficulties, owing to the very notable variations of the normal signs of the benignant disease have doubtless been experienced by many of us; but practical experience must have similarly led to the conclusion that nothing less than the application of the time-honored measures of complete isolation of patients, and the vaccination of all exposed persons, have proved efficacious in stamping out an outbreak.

As regards, however, the biological meaning and interpretation of this remarkable modification of the type of smallpox, I take pleasure in referring to the quite remarkable references to the general principles underlying the difficult question of immunity and modification of virulence in disease, contained in that portion of this report prepared by our confrère, Dr. J. E. Monjaras, of San Luis Potosi, based on his own experiments.

Thus, after referring to the continued presence in the alimentary and respiratory areas of morbid germs, indefinitely, until the opportunity for their invasion arises from within the system, he says:—

"We must, therefore, give less credit to the influence of contagion in the development of transmissible diseases, and modify our present explanation thereof, which gives such a great importance to the contact of pathogenic microbes in the system, as we have seen that in some cases this contact is entirely innocuous.

"For us the contagion arises not when the microbe comes into contact with the surface of our tissues, but when it commences to flourish inside of them, giving rise to the development of a culture that at first is strictly local."

Again, after referring to the influence of cosmic influences, as temperature, humidity, electrical influences, etc., the report states:—

"In fact, we cannot entirely separate a body in a state of activity, such as the cell, from its environment without endangering the phenomena of its life, or vitiate these conditions without injuring the system of which it forms a part; its activity producing certain products, as has been demonstrated by Hallopeau and Gautier in Moscow.

"The causes that may influence the cellular activity and determine the appearance of toxic substances in the system can evidently, as well proved by H. Boucher, only proceed from two sources—either from the system itself, which alters nutrition, according to the conditions of strength or weakness in which it finds itself, or from the outside matter in which it moves and by which it is surrounded on every side, and whose qualities produce an incessant variation.

"It is therefore in these media, so variable in their composition, where the specific determining causes find that principal co-operation without which the other causes generally are left impotent for the development and spread of transmissible diseases. It is in the extensive variations of the environment that we must look for the mechanism that presides over the appearance of the infectious principle."

Nothing can be of greater importance than the thorough investigation of such problems of environment as are thus referred to by Dr. Monjaras, and in our northern climates, where for months the whole population are domiciled in what I have called artificial climates, had we means adequate for the purpose where the direct influence, not alone of microbic air impurities, but of the increase of carbonic acid and organic animal products, and of the decreased amounts of oxygen and its nascent forms due to electrical action play their parts. Further than this, we might determine with accuracy the influence of decreased atmospheric humidity, and the effects of the unequal distribution of temperatures on the body by cold wall currents, cold floors and draughts upon the thermic centres of the body, which govern the cellular functioning organs.

The work in this field hitherto done is but preliminary to what is necessary to be done before the relative importance of the remedial cause and the exciting cause of each contagious disease will be determined.

Insects as Disseminators of Disease.—The year has been fruitful in experimental work and discoveries in a field, which if not new, is one which has hitherto received but little attention.

Diptera.—So early as 1870, Davaine, attributed to flies an important part in the spread of the anthrax, from dead infected materials to living animals; and in the past five years positive experiments have added much to our knowledge of the subject. This subject was briefly but very admirably set forth in a paper by Dr. Roman Ramirez, Lacubaya, Mexico. He pointed out that the external formation of many *diptera* is specially adapted for the collection of all sorts of small objects on account of the microscopic hairs that cover their bodies and legs. He further points out that several flies, by sucking the blood of diseased persons, can transmit disease.

Dr. Veder, in the same transactions, points to certain localized epidemics of dysentery investigated by him, as caused by flies through carrying infection from faecal matter.

In a paper read before the section, on "Tropical Diseases," of the British Medical Association meeting held in August last, Dr. George H. F. Nuthall, Demonstrator of Bacteriology at Cambridge, England, whom this Association is proud to call a member, and a native of America, has given this whole subject in review in a most interesting manner. They play both a passive part as carriers of disease, and a more active part in some species as becoming the hosts of the several germs, and thus through bites, inoculating the wound through their virus.

Kitasato, in Hong Kong, in 1894, noticed many dead flies in his laboratory, and caused the death of an animal by inoculating it with the contents of a fly. The fly was seen to contain bacilli of the plague. Hankin, in India, in 1897, found that the excreta of certain ants contained virulent bacilli after being fed on rats dead of plague. He thought such ants might be carriers of the disease to living rooms, through their excreta being deposited as dust.

Similarly Manson, Haffkine and others, have found the cholera spirillum in the intestines of flies, and sterilized milk has been found to have been inoculated with flies taken in a prison where cholera prevailed.

In the last annual report of Surgeon-General Sternberg, the part played by flies in the dissemination of typhoid fever in the permanent military camps of the United States army during the Spanish-American war in 1898, is referred to. The report states: "At the time of the outbreak and rapid spread of the disease, all the camps were suffering from what many reports characterized as 'the plague of flies.' Clouds of these insects swarmed about faecal matter and filth of all kinds deposited on the ground or in cesspools or sinks, and conveyed foul and infectious matter thence to the food exposed while in preparation in the camping kitchens, or while being served to the men." Inasmuch as some diptera are blood-sucking flies, and as Celli and Alessi are reported having isolated virulent typhoid bacilli from the excreta of flies, it is in keeping with what is known now regarding the mosquito, that such may actually inoculate the blood with the virulent bacilli of disease.

Equal or even greater interest attaches to the work first systematically begun by Dr. Patrick Manson, L.L.D., when in China he first made the observation that the *filaria Bancrofti* is communicated from one individual to another through the agency of the mosquito; interest in which was still further notably aroused when Dr. Major Ross, in Calcutta, described the life-cycle of the haematozoon malariae as taking place through the

agency of a particular species of mosquito, the *Anopheles claviger*. The recent report of the German commission to Italy on "Malaria," includes, however, the *Culex pipiens*, or grey mosquito of Ross, carrier of (proteosoma or parasite of birds), as being in Tuscany equally with *Anopheles* the host of the germ.

In a very recent paper by Prof. Koch, on "Malarial Parasites" the life history of the two species is set forth, and as being largely confirmatory of previous work by Dr. McCallum, of Toronto, and Major Ross is of special interest.

Summarized it is as follows as regards both *Halteridium* and *Proteosoma* :

1. Young parasite—composed of achromatin nucleus, very scanty plasma and no pigment, lives in or on red-blood corpuscles.
2. Adult parasite—chromatin, pigment and relatively considerable increase in plasma.
- From this point development may proceed in two ways.
2. (a) Endogenous (that is in body of principal host, as birds, &c.) by simple division into numerous small particles which commence these cycles afresh, abandoning the pigment of the mother cell.
4. (b) Exogenous—that is in the body of its intermediate host.
1. The mosquito parasite lives in the blood corpuscle and can be differentiated into male and female.
2. Formation of spermatozoon and impregnation of female.
3. Conversion into vermiform bodies which,
4. Pass through the stomach walls and form coccidia-like spheres in which
5. Sick-like bodies develop,
6. Passage of these into the poison glands and possibly other organs.
7. Infection of principal host.

The experimental work necessary to lead up to the beautiful results of Dr. Major Ross were obtained by him by means of the grey mosquito, infecting sparrows with the proteosoma. After proving the fact of the transmission to sparrows of the disease, he endeavored to work out the life history of the pigment bodies found by him in the walls of the intestine of mosquitoes. He found these *somata* or black bodies occupying spaces in the muscular walls of the stomach. There grow for seven days to such an extent as to seem like a wart on the outer walls of the stomach, and likewise into the body cavity of the insect. There are groups of the full grown pigment bodies called coccidia, which can be made under pressure to burst their body-walls, or will do so in evolution, by the growth of the contents. These consist in certain peculiar bodies called germinal rods, which are very minute, somewhat flattened bodies, and are present in enormous numbers.

They have not very definite locomotive powers, and evidently are by direct passage, and osmosis diffused into the blood current. He found that in this way they are carried to the venous salivary glands, which consist of a number of plump cells along a branching duct. There is one gland on either side of head or neck; innumerable germinal rods or sickle-shaped bodies were found by him in the cells of these glands, like groups of bacilli.

The long ducts of these glands on being dissected, were found to end in the common trunk in the proboscis of the mosquito. The proboscis runs under the head in the middle line enters the base of one of the stylets or lancets of the proboscis; the central impaired one, called the tongue or epipharynx, traverses its whole length and opens at its extremity in such a manner that the secretion of the gland must be poured into the very bottom of the wound made by the piercing proboscis.

The secretions of the glands are, it is assumed, poured into the wound for the purpose of checking the spasmodic contraction of the torn capillaries of the skin, which would otherwise quickly stay the flow of blood from the wound.

So much then for the immediate cause of malaria.

The reports of the malaria expedition conducted by Major Ross to the west coast of Africa, repeat the statement from different stations, that the *Anopheles*, the mosquito of pools, wherein vegetable matter is present in abundance, and not the domestic mosquito of the water barrels, is the carrier of the malaria germ. It has a long proboscis, has a different habit or attitude when at rest, and is marked by its dark spots on the edge of fawn colored or dark, greenish black wings. It bites at night and is often found asleep during the day. In 48 hours after feeding the stomach becomes empty and the eggs are laid. The insect is then ready to feed again, which if the mosquito has been put into a bottle, can be effected by placing the mouth of the bottle on the hand of a man, when the *Anopheles* gorges itself. It voids blood likewise in sucking.

The larvæ further are different forms from those of the common *Culex*.

The eggs, too, are different, and when laid attach themselves to objects floating on the water pools, and hatch in 24 hours.

CONSUMPTION IN ONTARIO AND THE RELATIONS OF THE MEDICAL PROFESSION THERETO.

By P. H. BRYCE, M.A., M.D.

July 12th, 1899.

Mr. Chairman and Members of the Huron Medical Association :

GENTLEMEN,—It is with much pleasure that I have accepted the invitation of your Association to discuss for a brief time a subject, which of all medical questions is to-day occupying in the largest degree the interest of the medical world, and indeed of society at large.

In the great communities of the temperate climates of both continents the attention of society is being directed to the causes underlying the prevalence of this generally disseminated disease, and perhaps at the present moment yet more to the means of its prevention and cure. When it is realized that even in our own comparatively thinly settled Province this disease caused in 1897 over 11 per cent. of all deaths or 1.4 in every 1,000 deaths, it is evident that no subject can more properly engage the attention of a society whose aims are so wholly devoted to the amelioration of the suffering of their fellow-citizens and to a widening of our knowledge of those scientific problems which occupy the attention of the medical profession of this country.

The interest which the study of this disease has for us as medical men becomes increasingly great when we recognize how numerous are its varied manifestations, how insidious its beginnings, and yet, though so often slow its evolution, so fatally persistent in its progress. From birth to old age this disease is present, often obscuring as mists of the morning our vision in the diagnosis of the diseases of infancy, again seeming for the few short years of childhood to be dissipated as the clouds at noonday, only to return once more with adolescence as a dark storm cloud, too often bringing rapid ruin and destruction with it; or if such be delayed, then only to leave constitutions as shattered ships, gradually but surely breaking up until they finally disappear in the deeper gloom. So generally spread, indeed, are the germs of this disease that the physician must ever be prepared to see them taking advantage of the invasion of every acute disease, as when in typhoid, pneumonia or pleurisy they make the attack at some vulnerable point when the vital resistance of the patient is at its lowest point. Living as we do in a country having no large centres of population, those conditions which fully illustrate all the protean phases of the disease do not greatly exist, yet by reference to the mortality returns of Huron we can find abundant materials for our serious and profitable consideration. I have examined the returns for 1898 for Huron and find that 72 deaths are returned as due to consumption or tuberculosis, arranged according to ages and sexes as follows :

Deaths from tuberculosis in Huron county in 1898.

Sex.	Under 5.	5-9.	10-14.	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-70.	Total.
Male.....	1	1	1	3	5	..	3	2	3	1	3	4	26
Female.....	2	1	3	6	10	7	4	5	3	..	3	2	46

The first notable fact we learn from these figures is the great disproportion between the deaths of males and of females, there being almost two of the latter to one of the former. The figures as to ages are perhaps too few to generalize from, yet it will be noticed that the preponderance of females beginning in the 10-14 year period is maintained until child-bearing has practically ceased or up to forty years. Making, however, due allowance for the fact that, as in many other parts of the Province, there is the tendency of the young men to migrate to other parts, it must be apparent that some potent forces are operative to make a difference between the male and female deaths from 10 to 40 years vary as 14 to 35. We shall refer to this again. Another interesting table grows out of these returns, viz., that showing the duration of the disease. It must be regretted that this particular is not more complete and accurate, since we find the following :

1	death at 23 years,	after 4 days' illness.
1	" 10 months,	" 3 weeks "
1	" 14 years,	" 1 " "
1	" 36 "	" 3 " "
1	" 62 "	" a few weeks' illness.

Again, of deaths stated to be due to illness under one year we have one after two months, three after three months, one after four months, one after five months, five after six months, two after seven months, two after eight months, two after nine months, and three after eleven months. Thirteen returns are made giving no data as to length of illness. Of the deaths where the illness is given as over one year I have taken the year periods, neglecting the odd months, and find fifteen over one year, eleven over two years, four over three years, one over four years, three over five years, and one over seven years. The total of those over one year give an average length of illness of two and one-seventh years; or including those exceeding one month up to eleven months with an average sickness of seven months. There were fifty-five deaths with an average illness of one year and seven months. We thus have then in the 747 total deaths which occurred in the county in 1898, 72 or 10 per cent. due to this disease. It will be noticed that the percentage is 1 per cent. lower than the average for the whole Province. While it is incidentally some satisfaction to know that the county of Huron, and indeed the whole northwest peninsula, has for years shown a relatively low mortality from this disease compared with some of the less elevated counties in the Province,—with their heavy clay soils and poorer surface drainage,—yet it will be generally conceded that 72 deaths in a population of 70,000 persons demands our serious attention.

Its presence in the same family.—Some years ago I endeavored to estimate from our mortality returns, through taking the names of all persons dying from this disease in a community during a ten-year period, what proportion those names which were repeated bore to the total deaths, and took three old settled counties, Prince Edward, Welland and Lincoln, for the purpose, and with the following results:—

Deaths from consumption in eleven years in three counties, Welland, Lincoln and Prince Edward, total deaths, 1,184; total names, 813; percentage of all names repeated, thirty-seven; average number of times each name was repeated, 2.6.

For our present study I have had the same return made for Huron for the years 1889 to 1898.

The total deaths from tuberculosis in Huron from 1889-1898.....	633.
Total family names occurring more than once.....	115, or 18.1%.
Total persons dying whose names occurred more than once.....	208, or 33% of whole.
Total average of times repeated names occurred.....	2.6 times.
Family names repeated—	

60 names.....	twice.
25 ".....	three times.
10 ".....	four "
2 ".....	five "
6 ".....	six "
1 ".....	eight "
1 ".....	nine "

It seems then perfectly plain that we have here on a broad basis the fact proven, which in isolated instances must have been observed by every practitioner present, that consumption is, if not a disease of certain families, at any rate a disease of particular houses; and until the zymotic character of it as a disease had been demonstrated by Prof. Koch led the profession to suppose that it was in a peculiar sense hereditary. On this point Prof. G. Sims Woodhead, of the Royal Research Laboratory of London, has recently remarked: "I am thoroughly convinced that there can be no tubercle without the presence of the tubercle bacillus, and that in every case the disease is transmitted through the agency of this bacillus. . . . That being the case, I am firmly of the opinion that heredity, using the term in the sense in which it is ordinarily used, can account for very few—in fact for practically none—of the cases of tuberculosis that occur either in the human subject or in animals. . . . Prof. Bang's experiments in Copenhagen certainly afforded conclusive evidence that tuberculosis (in cattle) was not hereditary, children did not inherit tuberculosis from their parents, though they might undoubtedly inherit that weakness of constitution and tissues which constitutes 'predisposition' and renders them peculiarly liable to harbor and nourish the parasites which in the parents had done such damage."

How constant the danger to such "predisposed" children infection may become when the disease is widespread may be gathered from the statistics of a single crowded ward in New York city, where it was found on actual inspection that of the 663 houses in the ward 37% had present one or more cases of consumption, or there were .81% of cases for every house in the ward. With the average duration of each of such cases

extending over an average of eighteen months in filthy, crowded and badly ventilated houses, we can readily understand how great must become the danger and how intense the infection, when it is estimated that the sputa from a single case contain as high, according to estimation, as 10,000,000 bacilli in a single day.

The Diagnosis of Tuberculosis.—Having illustrated the general prevalence of tuberculosis in the community, its zymotic and communicable character, and the conditions under which it most commonly invades the system, it is of the first importance that physicians realize these facts in order that they may be in a position to take such measures as are best calculated to prevent the progress of the disease in the individual attacked, and its dissemination especially to other members of his family.

Until within very recent years it may be said that the disease was but seldom diagnosed until the physical signs were well advanced. Thus Dr. S. Edwin Solly, of Colorado Springs, who has written largely from experience in the treatment of the disease in the high climate of the Rockies, gives the following table of 100 successive cases. He found :

In 48 cases treated as soon as diagnosed.....	{ 24 were in the first stage. 14 " second stage. 14 " third stage.
In 52 cases not treated for several months or even years after onset.....	{ 14 were in the first stage. 17 " second stage. 21 " third stage.

Under the conditions by which sanatorium treatment of the working classes in Germany is conducted in connection with the Workmen's Insurance Laws, Dr. Gebbard, of the Hanseatic Insurance Co., reports that of 1,541 cases treated during 1893 to 1897, 30.9% were slightly affected, while of 300 cases treated at the Halila Sanatorium in Finland 60% were in the second stage. It will thus be apparent that it is especially to the interest of the German insurance companies to send patients at the earliest stages to sanatoria for treatment and that as a result 30% were treated when slightly affected, and that of the 1,541 cases.

Full working capacity took place in 71.8 per cent. of the cases.	
General improvement " " 85.5 " "	
Local " " 58.1 " "	

Or taking the figures of the Bremen Insurance Society in 1896, of 297 patients treated at the Richburg Sanatorium,

23.9 per cent. were slightly affected.
32.7 " " moderately affected.
43.6 " " seriously affected.

It is very noticeable therefore, that in recent years, showing how curability of the disease in its early stages has been fully realized, early diagnosis is becoming necessarily more frequent. As we are aware the only one method which, apart from physical diagnosis, has been made use of to any extent with us is the microscopic examination of the sputum, and this as yet I am afraid to only a limited degree. You are aware that for several years the Provincial Board of Health Laboratory has been examining all specimens, properly packed, free when sent through the local boards of health. Doubtless there are physicians who do their own work ; but it must be confessed that up to the present, exact diagnosis of cases of tuberculosis is still very partial with us. That great interest, however, is being shown in this matter may be gathered from the last quarterly report to the Board by Dr. J. J. Mackenzie, its bacteriologist.

He examined during the quarter 218 specimens of sputum, with which 138 history cards were sent. He states that the number is probably too small, and the work too new to base any very definite conclusion upon.

The following were his results of 138 specimens—57 were positive and 81 negative.

The cards gave the following information :

	Positive.	Negative.
Under 10 years, 2 specimens	50 per cent.	50 per cent.
10-20 years, 22 specimens.....	36.3 per cent.	53.7 per cent.
20-30 " 46 "	50 " "	50 " "
30-40 " 33 "	33.3 " "	66.6 " "
40-50 " 21 "	57.1 " "	42.9 " "
Over 50 " 14 "	14.2 " "	85.8 " "

Another question asks for duration of symptoms—

	Positive.	Negative.
Symptom—One month and under, 18.....	16.6 per cent.	83.4 per cent.
One to two months, 26.....	34.6 "	43.4 "
Two to three months, 14.....	50 "	50 "
Three to six months, 27.....	55.5 "	43.5 "
Six to twelve months, 28.....	46.4 "	53.6 "
One to two years, 8.....	62.5 "	47.5 "
Over two years, 15.....	26.6 "	73.4 "

Another very interesting statistic is gathered from answers to the question as to a history of infection. All did not answer this question; but of those answering, 34.4% of the positive cases, gave a history of infection, while in those specimens when the bacilli were not found, only 7.4 gave a history of positive exposure.

To the practising physician these figures are of very great value and interest. For instance, a patient comes to him complaining of general debility, often a slight cough, perhaps of a catarrh of the respiratory passages. He very properly fears and looks for tuberculous infection, and failing with his physical diagnosis, sends some of the mucus discharged. We have been told that under three months, less than 50 per cent. have not given positive evidence of tubercle. What is to be the conclusion and action of the physician? Clearly it is not to conclude that tubercle is not present, since as a matter of fact the tubercle may be in the sub-mucous coat, and no bacilli able to reach the sputum, until at a more advanced stage. At this stage, Trudeau, Bowditch and others have occasionally made a crucial test of injection with tuberculin, which has proved so marvellously accurate in bovine tuberculosis, with the result that a rise of temperature has indicated the presence of tubercle, otherwise impossible of demonstration. The Roentgen rays are proving too in some instances of practical utility, by indicating through altered lung expansion, tuberculous deposits in the pneumonic pleura.

It is further most interesting to learn from recent experimentation how frequently the pharyngeal mucous membrane is the seat of tubercular deposit, and how numerous are the cases where the tonsils seem to have been the channels whereby the bacillus has found entrance to the cervical lymphatics. Thus:

Regarding inoculation with the bacillus tuberculosis, Dr. Hugh Walsham, of London, England, in a remarkable paper giving the results of his pathological investigations, quotes Dr. Sims Woodhead, who says: "I am driven to the conclusion that this method of infection of the glands of the neck through the tonsils must be of a comparatively frequent occurrence, especially in children living under insanitary conditions and subjected to various devitalizing influences", and proceeds to cite the experiments of M. Dieulafoy, before the Academy of Medicine, Paris, who obtained a number of portions of tonsils and adenoid vegetations, removed on account of hypertrophy. With material taken from twenty-one cases of hypertrophied tonsils and inoculated into guinea pigs, eight became tuberculized; and of adenoid vegetations from thirty-five cases, seven guinea pigs became tuberculized. As objections were made that the bacillus might be in mucus and not in the tonsil, Dr. Walsham made sections of tonsils from persons who had died in the hospital, in most cases from tuberculosis, but had not apparently suffered from tonsillar tuberculosis. Microscopic examinations showed that twenty out of thirty four cases had tubercular tonsils. While not finding tubercles in portions of hypertrophied tonsils removed from living persons, he quotes Dr. M. Lennoyez to show that tubercular adenoids and tonsils do exist, and that general infection has at times resulted, owing to the wound made by their removal. He concludes:

First. That the tonsils are very frequently affected.

Second. That tubercle may be primary in the tonsil.

Third. That they are frequently affected secondarily in pulmonary cases.

Fourth. That the cervical lymphatics are frequently affected through them.

Fifth. That the tonsils may be affected from without or through the blood stream alone.

Such then are some of the principal results of modern medical progress in placing the practitioner in a position to deal effectively with the disease, which, till very recently, were wholly wanting. Formerly the careful observer might trace, it is true, such general symptoms as would lead him to suspect the presence of the tubercle, and to take steps to

promote general nutrition ; but the very uncertainty of his position necessarily prevented any comprehensive or positive action.

Measures for dealing with early cases.—I have indicated the means by which we are now enabled to arrive at a positive knowledge in every suspected case of tuberculous infection ; and assuming that the physician has done all his duty in determining the position in any particular case, we may enquire what line of action may best be pursued to obtain the best results. And the first point which arises is one so difficult of determination that I have little doubt but that the gentlemen present may hold different opinions regarding it. We are all aware how the word consumption mentioned to a patient has in the past seemed almost equivalent to telling him that he has been condemned to death. If it were true that the sentence were to be executed in a very short time, I presume all would agree, at any rate in theory, that it is proper to tell a patient the fact in order that he might arrange his affairs accordingly. But we have seen from the statistics of Huron county of even a single year, that the disease from the period at which it was diagnosed lasts an average of at least eighteen months ; and from other statistics, as well as from our personal experience, we know that cases may last several or even many years. It is further true that conscientious physicians have found that to tell a patient that he was affected with tuberculosis has resulted in the patient or his friends being so averse to believing such a possibility that they have gone for advice to another physician, who, less honest or capable, has pooch-pooched the idea, set down the first as an alarmist or incapable, and succeeds for the time-being in securing a new patient, and by tonic treatment seemingly making good his position. After such experiences, physicians will conclude that pursuing a Fabian policy is probably most in keeping with his own interests if not those of his patient. Personally I am fully convinced that from the standpoint of the individual interests of the physician, such action is not only wrong, as well as being morally inexcusable, provided that he shall have had such experience of men as to be able to state the position so carefully as to cope successfully with the individual idiosyncrasies of his patients.

Dr. Solly, of Colorado Springs, in a chapter on—"The Individual in Climatotherapy," discusses the influence which the conduct and temperament of the consumptive exerts upon the progress of the disease. He says, "That looking over the original notes of 141 cases, and recalling mental pictures of each individual and his surroundings, I find it comparatively easy to range them under the several temperaments of Hellwig's Table—

Temperament	Receptivity	Reaction
Chlorotic	Strong	Strong
Sanguineous	Strong	Feeble
Melancholic	Feeble	Strong
Lymphatic	Feeble	Feeble.

By the terms receptivity and reaction, he simply means that degree of nerve force in the individual which measures "his capacity to receive an impression from, and his power to react to his environment. Such a receptiveness may be termed as "nervous," as opposed to phlegmatic temperaments. Corresponding reaction when strong, would be "sanguineness", when slow, "lymphatic". Such distinctions are all recognized as having a practical interest, for us in disease, since they indicate for us certain phenomena as variations of pulse, temperature, etc. I am positive however, that in this matter of the individual, we need assign as regards treatment and prognosis, at least as great or even greater importance to the matter of education, self control and moral qualities in the patient. Indeed Solly devotes a section to this question of wisdom and unwisdom. Going carefully over his 141 cases, he found 61 per cent were wise, and 39 per cent unwise. Comparing these results with the table of temperament, he notes that the greatest amount of wisdom was among those of a phlegmatic temperament, and strong physique. Turning to his table of cures he points out that in cases in all three stages of the disease the percentage of cures in the wise was one third more than the average, and nearly four times as many as in the unwise ; while a similar difference prevailed in the cases in the first stage.

I have referred to these somewhat unusual statistics and the remarks on them because I deem it as of prime importance for the physician in setting out on the campaign for successfully dealing with cases of chronic disease to accurately estimate the value of

the various obstacles to be overcome, and the amount and quality of weapons at his command. I am fully aware of the many practical difficulties which in everyday practice the physician finds not only laying down a definite line of occupation and regime in the life of his various patients, but it is our duty not only to appreciate the end we are aiming at but to make the patient our confidant, thereby obtaining as far as possible his confidence and his ready willingness to enter into the struggle against his disease with his physician. Assuming both these points gained, the physician has the further practical problems to deal with, such as the location of the residence, its construction as regards drainage, lighting and ventilation, and the social position of the patient. He may be young and dependent upon others, or he may be the head of a household dependent upon him for support. Now I am not prepared to say that the physician in routine practice is in duty bound to become in all these matters the tutelary deity of all his patients, although I am convinced that many do become practically that to many families; but speaking from the standpoint of successful results in dealing with a disease so dependent upon nutrition as tuberculosis is, I would say that our own experience as well as the experience of all the great physicians of the world who have dealt with this disease, teaches us that we have no alternative but to become this to every patient if we are to keep him under our treatment. The conclusions of the three great congresses of Paris, Moscow and Berlin have all been the same, and are summed up in the brief axiom, "*Fresh air and the regulation of the patient's life*"

It becomes apparent therefore to us, whether as individual practitioners, members of a county association, or of the body politic, that assuming on the basis of last year's mortality returns the existence of 150 cases of tuberculosis is under treatment in the county to-day, we have to solve the problem of curing these under social conditions similar to those which have existed during past years,—which means that we really enter upon the problem of regulating the daily life of probably 150 homes,—or else we have to adopt some other plan whereby we can practically gather all these patients into one or more schools, sanatoria, homes, or whatever you like to call them, and to there regulate for a time their lives and by example and practice inculcate in them such habits of personal hygiene as will enable them to return to their former or perhaps some more sanitary occupation to complete their recovery while at the same time earning a livelihood. We are all aware how far the evolution of hospitals has gone on in the Province, there being one or more in the towns and cities of almost every county; and we fully recognize that with regard to the poor and indeed others suffering from particular diseases that medical treatment can operate with greater advantage in these because of the facilities therein supplied. The abuses that have crept in along with the development of hospitals are not to be compared to the advantages due to the hospitals themselves.

The Problem of Sanatoria or Homes for Consumptives.—If the facts already set forth are such as will be accepted by us as medical practitioners it would appear, that as a County Association we may very properly advance another step in attempting to deal with that problem of problems, the treatment of tuberculosis, with a view first to the care of those infected, and second with a view to lessening its future prevalence.

I have already referred to some statistics obtained from German sanatoria, which have had under treatment persons sent to them by the Society or Companies who insure all work-people who, not receiving a greater daily wage than \$1.50, are required by law to be insured. The law provides that for a certain percentage of their wages paid over to the Insurance Companies they become entitled to treatment and half-pay for an average of thirteen weeks.

As a very noticeable percentage of the insured sick suffered from tuberculosis, which formerly ran its ordinary course, the company having to further pay the death claim; it soon became apparent that there was nothing which so lessened profits as deaths from consumption. Some four years ago the experiment was made of sending sick workmen to sanatoria, the insurance company arranging for the scale of fees, which has averaged from \$4 00 to \$5 00 per week. The experiment from the first proved so successful that in 1898 societies and municipalities were spending nearly \$1,000,000 for buildings alone as sanatoria, the object being to get the insured into these at the earliest moment possible in order that a cure might be effected, and that if not cured entirely the company would by restoring their ability to labor delay the period when a death claim would have to be paid.

Dr. Gebbard of the Hanseatic Insurance Co. has made the statement from actual calculation that it would pay the company to establish a sanatorium if out of 450 patients 150 could have their lives continued so that they would be enabled to continue at work one year longer than otherwise. The importance of the statement may be estimated from the fact that the cost of sickness in the different societies in Germany was in 1891 \$21,312,610.00. There were 21,498 associations and the cost of medicine and medical attendance was \$7,399,155.00. If then such an evolution of systematic methods for the treatment of consumption has taken place in so short a time, it would appear beyond question that there are undoubted advantages attaching to it. Dr. Walters, a prominent London physician, has just given us in a large published volume the latest information regarding sanatoria for consumptives, situated in every part of the world. In his chapter on "The Fresh Air Treatment" he says:—"An open air life is the key-note of sanatorium treatment. The patient, instead of being kept in a warmed room, ventilated from other parts of the house, according to the popular notions of old, lives in the open air from morning till night in all seasons and in all weathers. Lack of fresh air is the predisposing cause of consumption; fresh air is the most potent means of restoring him to health." Shelters against wind, excessive cold, extreme heat and rain are provided. Attached to such sanatoria quite large grounds, preferably sheltered by forests of evergreen, are a desideratum. Walks, with shelters and resting stations at short distances, are provided, with gentle inclines, verandahs, and covered corridors with glass windows on exposed sides are likewise provided. On these the *rest cure* for those with fever are carried on, the patient being wrapped in flannels and furs and reclines on chairs for the purpose, and is provided in cold weather with foot warmers. The heart is rested in this way, and the blood of course flows more easily to the apices of the lungs. Evening air is found not to be injurious to those inured to this out-door life. In many German sanatoria a simple system of hydrotherapy is practiced.

All this may seem simple and readily carried out, but experience and observation have shown that close and systematic medical supervision of every patient is necessary if good results are to be obtained. Patients who are febrile must be kept at rest; if persistently so, they are best in bed and their cots are wheeled on to the verandahs, thereby improving the appetite and improving the circulation. As the patient improves, exercise in the shape of passive motion is given, with massage, and resisted movements with the patient still in the recumbent position. This is followed by gentle walks a few yards and then a rest, and increased from day to day as experience dictates. Great care is exercised to prevent over-exertion, and the patient must not exert himself till he gets out of breath. A brisk frictioning with a little food after their walk is practised, while half an hour of rest should be taken before and after every important meal. Sedentary occupations which contract the chest are forbidden, but every encouragement is given to occupations, keeping the mind healthy. Gentle games for the stronger patients are practised, croquet in summer, gentle cycling, and sledging in winter are encouraged, especially those tending to deepen the inspiration and carry the air into every portion of the lung tissue.

The balance of the treatment is especially directed to the feeding of the patients, good plain mixed dietaries such as the well enjoy are the principal foods; and the amount of foods given does not notably exceed that in health. Easily digestible foods, rich in nitrogen and fats, such as milk, cream and butter, figure largely in the dietaries. Cod liver oil, much encouraged in English practice, is but little used at continental sanatoria. Medicines are not used except to deal with any special emergency which may arise, especially such as may improve that most difficult symptom,—dyspepsia. Alcohol is recommended by some; is wholly discouraged by others; and on the whole practice seems increasingly against its use in a dietary. Prolonged stay until the progress has gone on to a cure is manifestly necessary if permanent satisfactory results are to be looked for; and the more exact physicians do not consider a return to every-day occupations until repeated tests have shown the expectorations to be free from bacilli.

How to Establish Sanatoria in Ontario. I have briefly summed up the treatment which is practiced in sanatoria everywhere, and indicated some of the reasons why such are a practical necessity in Ontario if we are to look for success in dealing with cases of consumption. The problem remains to be solved, how shall we establish them. Experience on the Continent would seem to indicate that not more than 100 patients should be

congregated in a single sanatorium. Density of population means infection of the air ; while a certain number together are necessary for a fair degree of economy in management. I have already shown from statistics that there are probably from 150 to 200 persons affected with tuberculosis at the present moment in Huron county, and assuming that 50 per cent. of these are suited for sanatorium treatment,—that is, in a probably curable stage,—it means that, as during the past twenty years we have seen poor-houses established in most of the older and more populous counties by the county councils, assisted by the Government, so with much more reason we may go to them to assist in this work of establishing a county sanatorium

1st. Because many lives depend upon their action.

2nd. Because these lives are most largely of those in the earning period of life, as shown by our statistics, and therefore of most direct value to the country.

3rd. Because of the very general failure of home treatment in effecting a cure in this disease.

4th. Because of the enormous cost involved in the long sickness, nursing, and other necessary attendance.

5th. And lastly the great danger which the ordinary methods of home treatment necessarily have for other members of the family, and which have been unfortunately too well illustrated in the ten years' statistics of deaths already referred to.

Remembering that the patients going early to sanatoria will seldom be without means to pay at least part of the cost of residence and treatment, and thus be in a wholly different position, as regards cost, to that of the industrial home, we need not as a medical association hesitate to take united action in demanding that such a sanatorium be established in the county. The list of family names, in all, taken from the death returns of Huron, tell only too truly how the personal factor enters into the question with almost every citizen. Who has not some friend suffering from the disease ; and who does not long for some means by which their own dear ones may have an opportunity of escaping the inevitable fate which has hitherto been attached to the disease ? Were this association to go as a body to their representatives the matter could be determined in a single year. And I shall be pleased indeed to think that what I have said this afternoon may have been of some assistance toward so desirable an end.

REPORT ON THE BERLIN SEWAGE FARM.

BY THE SECRETARY.

July 14th, 1899.

To the Chairman and Board of Sewage Commissioners.

DEAR SIR,—As promised, I beg to send you a brief report on my inspection of the sewage disposal works of Berlin, in consequence of complaints by the authorities of Waterloo Township, of effluvium nuisances and stream pollution arising therefrom.

The works instituted some 9 years ago have served a notable purpose and been of great benefit to the city of Berlin.

The splendid water supply and very wide extension of the sewerage system in Berlin have played a most important part in the commercial progress of the town ; and when it is remembered that with the small stream as an outlet, the city has been able to dispose of nearly 1,000,000 gallons of sewage daily, without involving itself in legal trouble with the neighboring municipality it must be considered that the small cost, both of the original construction of the sewage farm and for its annual maintenance afford much reason for satisfaction.

Two permanent factors, however exist, making it apparent that the town can never look upon its expenditures, either in dealing with its waterworks or sewerage works as a finality, viz. : the increase of population, and the constant extension of the use by the people of both public water and public sewers. This being the case, it is apparent that so far as the sewage disposal works are concerned, your committee has always to be considering,—

1st. The extension of the sewage farm, and

2nd. The making the present farm do the largest amount of possible work, compatible with freedom from effluvia nuisances from the beds and adequate filtration of the sewage.

Although at the time of my inspection on the 4th of July last, there was no serious effluvia nuisance noticeable in the afternoon, and while the discharge from the effluent tiles was clear, yet there existed in the large beds covered with sewage undergoing decomposition, a condition, which must under favorable conditions promote effluvia nuisance, and therefore give cause for complaints. Of course this may be to some extent, inevitable with all methods of sewage disposal, as with manure heaps, their distribution on land and in industries such as tanneries, gas factories, fat-rendering, etc.

The matter therefore, is one which your Board will be expected to give special attention to, so that all reasonable causes of complaint may be removed.

To this end therefore, it will be necessary for the local board of health and sewage committee of the council, to consider the following points:—

1st. The institution of means by which,

(a) All matters such as chemicals which may be germicidal, are removed by private persons before the sewage from these premises is allowed to pass into the town sewers.

(b) The construction of a receiving tank of such capacity that the sewage may be deposited therein with all suspended matters, which will remain there until made soluble by decomposition, and from which only sewage in solution will go to the beds. I am convinced that effluvia which may at present arise from the beds are due notably to such solid matter putrefying on edges of ditches, beds, etc.

Such a tank might be very economically constructed at the sewage farm along the outlet sewer, and of a capacity to hold say, 6 hours sewage. Such should be divided into two compartments for convenience, and should be covered and ventilated.

(c) The beds should all be brought to a true level for purposes of cultivation, and even irrigation. If cultivation of crops on the beds were made systematic, care would be taken that only as much sewage in solution would be applied on each as would not stand and become stagnant, while regular working by cultivation would enable the ground to treat more than by present methods. The cultivation of beet-root seems peculiarly suitable on such soils as that of the Berlin Farm.

(d) Such disposal of the sewage, means the addition of more land to the Farm, and probably also the preparation of an area where the surface sewage can be purified on a rapid filter bed of either sand, coke or cinders, and of an extent adequate for the increasing needs of the case.

(e) That under the committee the whole Farm be put under the direct management of the town engineer, so that plans, surveys, estimates, returns of crops, costs and methods, can be made and preserved; and that thus from year to year the town and all interested would be able to know exactly just what the Farm has accomplished, and by what special methods.

I am,

Yours very truly,

P. H. BRYCE,

Secretary Provincial Board of Health.

REPORT ON THE PROPOSED SCHEME OF WATER WORKS AND SEWERS FOR SMITH'S FALLS.

BY THE COMMITTEE ON WATER SUPPLIES.

Toronto, July 14th, 1899.

MR. CHAIRMAN AND GENTLEMEN,—From the correspondence submitted, together with the plans prepared by Mr. Willis Chipman, C.E., it will appear that Smith's Falls is realizing the need for sanitary progress.

The proposition before the people at present, is to purchase the existing waterworks of Mr. Foster, and to extend them throughout the town.

The water is at present taken from the flume of Mr. Foster's dam which is fed by water from the escape weir of the Rideau canal, at this point.

The water has proved satisfactory for some years to those using it; but owing to its being drawn at a point in the Rideau, below a very considerable area of what was once drowned land, the question has arisen as to the advisability of using the river as a public supply. The problem is an important one, since the town is located on limestone rock, at places on the surface; and wells, bored into the fissured rock, have been shown in many instances to be polluted.

It may be further said that no other source than the Rideau within miles is available for a public supply. In company with the mayor, your secretary went up the river above the town for several miles to the next lock, where the channel is cut through the Laurentian rock. Here the stream is clear, flowing rapidly. Above this, again however, is a wide area of drowned lands, with the remains of tree stumps. Algid growths are seen in the shallow areas amongst them.

The river or canal is, however, a large stream receiving a large amount of water from the great and lesser Rideau lakes; two beautiful expanses of water, over which your secretary returned to Kingston the succeeding day. There are no towns on the lakes, which may be considered as large settling basins for the small amount of sewage from Perth, some 25 miles away on the river Tay.

In the reach between the town and the first lock above, the low drowned area has a rank growth of river grass, but the main stream flows swiftly to the lock and falls at the town. Some boat-houses are along the stream above the locks, and a few houses on streets close by. There are no sewers from these and no present evidences of sewage pollution are seen.

With a view to determining the character of the water, samples for chemical and bacteriological analysis were taken from the tap, the flume, the river several hundred yards above the locks and above all buildings, and at the locks three miles above.

The following is the report of the analysis by Dr. W. H. Ellis:—

	Tap.	Flume.	Upper Lock.	River above Town.
	I.	II.	III.	IV.
Chlorine	0.5	1.0	0.5	0.5
Free Ammonia	0.12	0.2	0.2	Trace.
Albumenoid Ammonia....	0.28	0.33	0.28	0.4
Hardness	2°	6°	6.5	6°
Bacteria, per c. c.	676	580	106	210

The analyses, allowing for the incidental variations in the bacteria due to the position of the flume and the agitation of the water at the falls, in samples one and two show the water throughout the whole area to be of essentially the same character, except that the strong agitation gives the water in the flume rather more albumenoid ammonia, which shows a further increase in the sample taken above the town, where the great river grass areas are on either side. The sample three miles above is essentially the same in character with the tap water.

On the receipt of these analyses, your secretary communicated with the town authorities, copy of which is herewith submitted.

Remembering the facts set forth and the great use there is for the town installing a general water works plant, it is recommended that this Board approves of water taken from the Rideau at any of the several points referred to, which may be approved by the engineer subject to the provisions:

1st. That the town take action when necessary, under the powers given under the Public Health Act and Water Works Act, to prevent any pollution of the river at any point above the intake, which might in any way endanger its wholesomeness.

2nd. That in order that the best results be obtained, a mechanical filter of approved character be installed, in order that any excess of vegetable matter, especially in the autumn, winter and spring months, be prevented.

All of which is submitted respectfully,

(Signed) P. H. BRYCE,
Secretary.

INSPECTION OF MUSKOKA HEALTH RESORTS.

By P. H. BRYCE, M.A., M.D.

Toronto, May 31st, 1899.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—I beg to report that owing to the large interests, both health and commercial, associated with the sanitary conditions of the health resort accommodation of the Province, I have endeavored to visit as many of the resorts in the Muskoka district this year as possible early in the season, in order that it might be practicable to have put into operation any improvements deemed necessary before the tourist season begins.

The following circular was issued, and has been well responded to indeed :

TORONTO, April 4th, 1899.

DEAR SIR,—In view of the approach of the Tourist Season, and of the increasing interest the transportation companies are taking in our Northern Health Resorts, this Board is anxious that by every means such resorts be made both attractive and safe to the health of the summer visitors. With a view to encouraging all keepers of Hotels and Boarding Houses to improve their accommodations, and to make better their water supplies and their methods of sewage disposal, it is my intention to visit during next May and later months, such of those as I find it possible to reach, and thereafter to use discretion in publishing for the benefit of the public, a list of places approved of or otherwise. I send you a pamphlet issued by the Board dealing with these matters, and request you to send as early as possible answers to the following questions :

1. Do you keep rooms for the convenience of the public, either as hotel or boarding house?
2. If so, how many rooms are there in your house, and state the number of persons for which you have boarding accommodation?
3. Have you a supply of ice laid in for the summer?
4. What is your water supply? (a) If from well, how is the well located as related to local sources of pollution? (b) If from lake, state how water is taken, whether by wind-mill or other pump, and at what depth and distance from shore?
5. What is the method of disposal? Giving details of (a) Excreta, (b) of house-slops, (c) of kitchen refuse.
6. How many storeys has your building? If an hotel, what are the fire-escape methods from second and third storey windows?
7. What acreage of land is attached to the premises proper?

Give such further details regarding your accommodation as will enable me to form an accurate estimate of your facilities for accommodating the public.

It is not intended that this information will be published, and is being collected only for the use of this Department in its desire to aid our resorts, while at the same time helping to protect the public.

Hoping to receive an early reply,

I am,

Yours truly,

PETER H. BRYCE,

Secretary Provincial Board of Health.

The information supplied gives an accurate idea of the extent of the room accommodation in the hotels and boarding houses of the district which have reported. It was not considered necessary to send the same circular to the hundreds of cottagers of the lakes, since last year the circular, of which the following is a copy, was sent to each, informing all of the law regarding the pollution of streams, and asking the co-operation of all towards keeping the district in the most perfect state of sanitation possible :

TORONTO, July 12th, 1898.

DEAR SIR :

With a view to maintaining the deservedly high reputation of the Muskoka Lakes District as a Health Resort, the Provincial Board of Health desires to draw the attention of all residents on its lakes and rivers to the Public Health laws relating to the pollution of streams. Sections from the Public Health Act are appended to this circular.

Apart from the purely sanitary question of preventing any excretal or sewage pollution of these lakes and rivers, where their waters may be the means of disseminating typhoid fever and similar diseases, if used as they generally are as the source of the domestic water supply, there is the further aesthetic sense which must be satisfied if the celebrity which the District already enjoys is to be maintained.

When nature has done so much it is not proper that any neglect in sanitary matters should be allowed to lessen or neutralize the advantages and benefits arising from its gifts.

Inasmuch, therefore, as here and there individual instances of pollution of these lakes and rivers are known to exist, the Provincial Board of Health has desired that this circular reach every householder, resident in the District, to inform them that under the powers to prevent and abate nuisances laid upon it under The Public Health Act of Ontario, it will take such steps as may be found necessary to prevent the pollution by any person of the waters of the Muskoka lakes and rivers, and to abate all nuisances or insanitary conditions arising therefrom in all cases coming to its knowledge whether by inspection or complaint, where the Local Board of the municipality has already failed to take action. It is, therefore, requested and expected that all owners or tenants of hotels, boarding houses, cottages or other dwellings, will consult the requirements of the Public Health Act and govern themselves accordingly and aid the Board in this work in every manner possible.

The Provincial Board requests that information regarding unsanitary conditions be forwarded by any aggrieved persons to the Secretary of the Board.

I have the honour to be,

Your obedient servant,

PETER H. BRYCE,
Secretary.

P.S.—Pamphlets descriptive of methods of disposing of house-wastes and sewage may be obtained on application to the Secretary of the Provincial Board of Health, Parliament Buildings, Toronto.

As is generally understood, the accommodation for the public in the Muskoka, and indeed in all our health resorts, consists—

(a) Of what are, or were originally, farm houses, which began by taking, in the crowded season, a few boarders, and which gradually have been enlarged until in a few years the accommodation of tourists has been the chief business, the farming becoming a secondary matter.

With the more successful of these, the original house has been either torn down or largely remodelled, and the several larger and best known summer hotels are capable of accommodating from 150 to 200 guests.

It is natural therefore to expect that we would find, as is indeed the case, the sanitary appliances varying from those of the simplest and crudest character, upward, until in a few, modern plumbing appliances, steam engines to pump water and heat buildings, have been introduced. As the accommodation varies from 10 to 200 guests, it is apparent that the needs from the sanitary standpoint vary in proportion to the number and density of the population.

It has therefore been my object to estimate the actual needs as well as the financial ability to make improvements of each resort visited, and to make such suggestions as would be adequate for each; and I may state that nothing has been more pleasing than the ready acquiescence, I may say in every case, in any suggestions made, and indeed in the case of the larger resorts, as the hotels, there has been a real anxiety exhibited that I make some such practical suggestions as would enable them to grapple with the vexed question of sewage disposal.

In no single instance did I find the least desire to persist in the too common methods elsewhere of pouring the sewage into the streams of lakes.

One thing everywhere in Muskoka has been recognized, viz :—that it is not good form, decent or tolerable to pollute the lake. Remembering then that provision has to be made in some cases for dealing with the sewage of 200 persons daily for several months, it will appear no easy task to have some simple yet effective method adopted, where as in several cases, the hotel is simply a house built on a rock.

Remembering how crude after many years are the sanitary conveniences of hotels in all of our non-sewered towns, where our local boards are supposed to have been exerting a steady influence, the efforts which have been made and are yet being made at these Health Resorts, for the comfort and health of their guests during a short summer holiday, are most commendable.

The remark has been made that there is not a first-class hotel north of Barrie, but it is apparent that all depends upon what is called "*first-class*." If by this is meant a four dollar a day hotel and all implied in that, I may say it is to be hoped in the interest of health-seekers, that our northern resorts may never see a first-class hotel. If it means comfort amidst healthy surroundings with reasonable conveniences available, at from one dollar to two dollars per day, then I would say there are a number of *first-class* hotels.

Referring in detail to some of the conditions found, it may be said that in nearly all instances, the brown lake waters are used for all culinary and domestic purposes, except drinking.

In a number of the hotels, spring water is supplied, and with ordinary care on the part of the guests, they can always obtain it. Ice water is also very commonly used.

With however, the care that is being exercised on every hand to prevent pollution of the lake waters, I am convinced both from observation, and for scientific reasons, that these lake waters taken at a depth and in places where the currents keep up free movements, are perfectly wholesome for drinking purposes.

Disposal of Excreta. Five hotels in whole or in part have water closets of modern type; while several others are having similar appliances introduced this year. These are :—

Minnewaska—Gravenhurst.

Oox's—at Port Sanfield.

Maplehurst—Rosseau.

Strouds'—Lake Muskoka.

Monteith—Rosseau.

Others under construction this year, are—

Currie's—at Bala.

Fraser's—at Port Cockburn.

In all instances where excreta and kitchen water, etc. have been disposed of by sewers, the disposal has hitherto been into cesspools.

These have so far as pollution of the lake was concerned, been satisfactory; but they have as has been as the case elsewhere presented difficulties regarding the overflow water.

The problem of how to dispose of the sewage in all such cases as of the larger hotels, is not only an urgent but a difficult one, and is made more difficult in individual instances by the character of the location.

The principle which I have in all cases recommended, is essentially that of the septic tank, with an overflow to receiving tank whence final disposal is made to sub-surface tiles, or an artificially made bed in which the principle of final nitrification of the sewage is to be carried out.

The difficulty has been to make the principles involved, clear to the person who is charged with the oversight of the work; and after this we have to assure ourselves that this work done will be satisfactorily carried out. Errors will doubtless be made, but the principle having been adopted, its ultimate success will be assured.

The following table is given from replies sent in to circular, supplemented by my own inspection.

	Rooms.	Water.	Disposal of Excreta.	Fire Escape.
Lake Muskoka, Gravenhurst—				
Minnewaska	40.....	Spring	W. C., by sub-surf tiles..	Verandah.
Robinson's	21.....	Well	D.E. and sub.soil for slops	Verandah.
Currie's (Bala)	50.....	Bala Falls ..	D.E., Drain sub-surfaces.	Verandah.
Mortimer's Point	25.....	Lake	D. E. (cess-pool)	Stairs.
Jackson's (Bala)	13.....	Lake.....	Privy, carried away by drains	Verandah.
Clement's (Bala).....	14.....	Well	Privy	Verandah.
Hutton House.....	13.....	Well	D.E. drain	Verandah.
Port Carling—				
Ruddy's Hotel	30.....	Spring	D.E. drain	Iron ladders.
Milford Bay (Stroud's).....	32.....	Well	W.C., cess-pool for slops.	Ladders.
Hugget's (Bala)	10.....	Well	Privy	Verandah.
Rosedale (Torrance)	5.....	Well	Privy, slops to pigs	Verandah.
Board's (Bala)	35.....	Well	D.E.	Verandah.
Whitesides (Sutton's)	20.....	Well	D.E., slops carried away.	Verandah.
Gravenhurst, Fern Glen	5.....	Well	Privy	Verandah.
Lake Rosseau—				
Monteith's	75.....	Spring by w. power	W.C., sub-surface.....	Verandah.
Woodington, Lake Rosseau ..	27.....	Lake.....	D.E., slop sink	Ladder.
Ferndale, "	40.....	Spring	D.E., slop sink	Spiral stairway.
Cleveland's, "	34.....	Well & W.M.	D.E., cesspool slops	Verandah.
Windermere, "	95.....	Well	W.C. (filter)	Verandah and iron ladders.
Fyfe House, "	29.....	Well	W.C., and cess pool	Iron ladders.
Maplehurst, "	45.....	Well	W.C. by drain to cesspool.	Verandah.
Laurason, "	12.....			
Lake Joseph—				
Hammell's	28.....	Lake.....	D.E., no slop sink	Doors.
Stanley House (McLeans) ..	55.....	Lake.....	D.E., tile drain to garden	Iron ladders.
Port Sandfield	26.....	Spring	D.E., sink for slops	Iron ladders.
Georgian Bay—				
Penetanguishene	150 people	Spring	Filter beds	Stairs.
Belvidere, Parry Sound	120 "	Lake.....	Daily returned refuse	
San Souci, Go Home R.	60 "			
Lake Muskoka—				
Beaumaris Hotel	75 rooms	Lake.....	D.E., slops to cesspool ..	Verandah.
Lake Rosseau—				
Port Sandfield	200 "	Lake..	D.S. & W.C.....	Verandah.
Peighton House	15 "	Lake.....	Privy, slops carried away.	Verandah.
Marinas House.....	25 "	Lake.....	Privy, slops carried away.	Verandah.
Jud. Haven	12 "	Well	D.E., slops carried away..	Verandah.
Lake Joseph—				
Craigilea	35 "	Lake.....	D.E.	Verandah.
Gordon House.....	15 "	Well	D.E., slops to bucket	Verandah.
Fraser's Port Coburn	200 "	Lake.....	W.C. filter.....	Verandah.

I propose as time permits to complete my inquiries, as a few resorts readily reached still remain on the Muskoka Lakes, while a number of those on Georgian Bay are asking for information regarding methods of sewage disposal.

What I think may be said with perfect confidence to the public, is, than nowhere in the areas inspected is there any danger from the water supplies; that very great care is being shown in caring for the household refuse so as to prevent effluvia nuisances, and that remarkable progress is being made in modern methods of sewage disposal in connection with even the smaller resorts of the Muskoka District; while the larger ones may from the present onward, be looked upon when their improvements are completed, as being object lessons to many people who go from our towns, of what may be done in the disposal of sewage by simple methods if scientifically applied.

The general character of these hotels is thus indicated. It would be impossible to tabulate all details, but it may be said that while in the smaller places the house slops are likely to prove a source of aerial nuisance if not regularly disposed of, yet the adoption of the suggestions made of sub-surface disposal from a small septic tank, discharged at intervals, will, it is hoped be of much advantage.

The notes of inspection include these various recommendations, and while the methods adopted, according to the location, will prove varied, yet I am convinced that the general desire shown to make improvements will result in notable advances in the general sanitary condition of all these Resorts. Where conditions were unsatisfactory, it is hoped that the instructions given will prove quite as effective as giving any publicity to defects would do.

The public have so many places to choose from that the business instincts of all caterers for public patronage will prove the best incentive, when all know that comparisons can readily be made. One of the best proofs that this district is, in so far as the pollution of drinking supplies is concerned, in a satisfactory condition, is seen in the fact of the almost complete freedom during the past year from all cases of typhoid fever, the sure index of sewage pollution.

I hope to be able, as the season progresses, to make further inspection of other places, and to ascertain how far the suggested improvements have been carried out.

Reverting to another phase of my inspection, it may be said that I had previously received complaints from the local board of Gravenhurst, as to the fears of the townspeople that infection to them must result from the growing habit of consumptives in advanced stages of the disease going to the boarding houses of the town for a change of air, usually at the request of their physicians.

This difficulty has been the invariable result in other countries whenever any district has become noted for its climatic advantages. Complaints were heard from many persons that consumptives, with their friends, write for accommodation to different boarding-houses, without stating they are in ill-health; and during the past season many obtained rooms in this manner, to the great discomfort of tourists and the detriment of boarding-houses.

Two sessions of the local board and council were held in Gravenhurst, when I was present, during which a series of clauses of a proposed by-law was prepared and discussed for the licensing of all boarding-houses within town, and the setting apart under inspection such as were willing to accommodate consumptives for this purpose only, making such liable to penalties if they entertained other boarders without notification to them of the character of the license held.

Compulsory notification by physicians and householders of all patients and inmates suffering from tuberculosis is a part of the by-law proposed; and the regular inspection and disinfection, with the supplying of spittoons and other necessities, are likewise added. Expectoration by phthysical persons on the sidewalks and in public buildings is likewise to be prohibited under penalty.

The Gravenhurst Sanatorium was inspected, and its progress and success in the work it has undertaken seem assured.

The accommodation has now reached 50 beds, and the results in those cases whose stay has been prolonged have been very encouraging.

All of which is respectfully submitted.

(Signed) P. H. BRYCE, M.D., Secretary.

REPORT OF THE COMMITTEE OF SCHOOL HYGIENE.

By J. J. CASSIDY, M. D.

November 15th, 1899.

Mr. Chairman and Gentlemen of the Provincial Board of Health :

GENTLEMEN,—Owing to the fact that the mere congregating of large numbers of children in our Public Schools exposes some of them to the danger of catching infections from the others, it is most important that medical inspectors should be asked to assist the educational authorities in preventing dangers of this nature.

To be of real service, the work of prevention should be prompt and efficient, because, while the health of the scholars should be maintained at a high level, inconvenience to the teachers and the general public from the closing of the room or even a whole school, is very much to be deprecated. The simplest way to attain this end is for a school board to appoint one or several medical inspectors according to the number of schools in the section. When an inspector enters upon his duties he can easily arrange with the principal of each school as to the hour most suitable for his visit. After the inspector has become acquainted with the children, a short daily examination would be sufficient. He could readily single out those whom it would be necessary to examine minutely. It would not be necessary to make prolonged inspection of each child every day. This of course need not apply to new scholars who would receive a thorough and rigid examination.

The length of the daily inspection would also be determined by the character of any infectious disease which might prevail in the neighborhood. Generally speaking, also, the season would influence the care to be devoted to the work. For instance, in Toronto, the curve for scarlet fever exhibits two maxima, one in April and a second one in November. As the contagion of this disease is particularly active, and as it chiefly affects children of school age a sanitary inspector should be more careful in examining his charges at these times. The Inspector should be a physician, a competent man and one possessed with good executive ability. He should have special fitness for diagnosing the diseases of children, more particularly the infectious and communicable diseases.

The early detection of measles is both important and yet difficult. Important, because this disease is infectious during the three or four days before the eruption appears ; and difficult, because to the unskilled observer, the eruption is its only characteristic sign. It will be too late to prevent the spread of measles in a school if a diagnosis is not made and isolation practised prior to the eruption period.

The diagnosis of diseases of the throat calls for microscopic and microscopic knowledge of the pathology of that part of the body. A scholar with an acute angina, should be viewed with suspicion and isolated until the question of infection in his case can be regarded as settled.

When necessary the bacteriological test should be made, so that diphtheria may be diagnosed at as early a stage as possible. Usually in Toronto, a test tube is supplied to practitioners, which answers the purpose very well. The tube contains a swab prepared from a piece of wire around which a bit of cotton is wrapped, and the tube is plugged with cotton. When a child's throat is to be examined, the swab is removed and is rubbed gently over the diseased portion of the child's throat. It is then returned to the test tube, the mouth of which is again plugged with cotton, and the tube is packed and sent to the bacteriologist for examination with a note, giving the date, name and address of the patient and the reason why the specimen was sent.

A scholar found to have an infectious disease should be isolated, and any other members of his family who are attending school should be dismissed and not allowed to return until all danger of infection has passed.

The books, scribbling books and lead pencils belonging to an infected child should be burnt or sterilized with steam and the school room thoroughly disinfected with formaldehyde gas. After disinfection the room should be well scrubbed and then aired and left unoccupied if possible, for two days.

Tuberculosis will also call for peculiar vigilance on the part of the Inspector. This disease is not only prevalent in Ontario among grown people, but is also noticed among children. Its early recognition in a scholar is of great importance ; for treatment to be successful, it must be begun in the first stage of the disease, and, as it is highly contagious, it is necessary that the infected scholar should be dismissed. No person, teacher or scholar who has consumption, should be allowed to remain in a school.

The vision and hearing of each pupil should be tested, and accurate information on these points given to the teachers and parents.

The relations of the medical inspector to the principal of a school, will be such that there need not be any misinterpretation of his office. He is simply a medical expert, prepared to recognize disease when present in a child, but not called upon to offer suggestions or advice as to its treatment unless, of course, in case of emergency. After examining the

child in the presence of the principal, the Inspector should make out his report, ordering that the scholar remain in the school or be sent home. If sent home, a note or printed form be made out, stating the disease the child has, with remarks, etc. Copies of these reports should be sent to the local board of health and the school trustees, every month. If such a system of medical inspection were inaugurated in this or any other city in Ontario, there is every reason to believe that without any extraordinary efforts being made or public business severely disturbed, many cases of infectious disease would be recognized, isolated and prevented from spreading any further in the municipality. Experience gained in the field of medical school inspection, would naturally train the mind of the Inspector to observe and note the respective merits and demerits of physical conditions in a school, in so far as they might be favorable or unfavorable to the health of the scholars. He would be in a position to observe and note the effects of the different means used in warming, ventilating and purifying the air, and of disposing of excreta in schools. His views would be practical and not theoretical. Statistics on school hygiene, drawn from the reports of such medical inspectors, would naturally have great authority, and would be most valuable to boards of trustees and boards of health.

Your committee are of the opinion that this board should pass a resolution expressing approval of the appointment of medical inspectors by boards of school trustees, and that copies of the resolution be sent to the Hon. G. W. Ross, Minister of Education, and the Hon. E. J. Davis, Provincial Secretary.

All of which is respectfully submitted,

(Signed),

J. J. CASSIDY, M.D.

P. H. BRYCE.

REPORT ON THE PUBLIC SCHOOLS OF PARIS.

By P. H. BRYCE, M.A., M.D.

TORONTO, Nov. 25th, 1899.

To the Chairman and Members of the Paris Public School Board :

GENTLEMEN,—At your request, contained in a letter from your secretary, dated Nov. 16th, 1899, I beg to report on the sanitary condition of your public school buildings. Owing to the notes taken at the time of my inspection not being available at present, I am unable to give measurements of rooms, but the following statements will supplement the remarks made at my meeting with the board.

KING'S WARD SCHOOL BUILDING.

Basement.—Latrines in good condition, and if the ventilation by windows and vent-pipe are cared for no unsanitary condition will occur. The basement furnace room was not maintained in as cleanly a state as is desirable; but the space in itself left little room for complaint. The fresh air boxes supplying ventilation were found to be both practically closed, and as one of the windows of the latrine room was closed, it was apparent that inexcusable carelessness and neglect exists on the part of the caretaker in the performance of his work. The result of this lack of fresh air was apparent even at the early hour the school was visited. Although the day was pleasant and the windows might have been opened, yet in one room especially in the lower flat the air was close and gave evidence to the senses of a chronic lack of fresh air. Other rooms were not so bad; but it is apparent that if teachers and caretaker do not do the best with the means at their command, no system of ventilation would be very effectual. With, however, the number of children present, the simple supplying of air by the flues working at their best will be insufficient. Indeed, until a system of forcing in fresh, warm air is adopted in your schools, and in those of other towns, the ventilation will be inadequate. An old disused register in one room was the receptacle of dust, which apparently no regular attempt is made to clean.

THE HIGH SCHOOL BUILDING.

This is an old building, and, except in the middle public school room, is in a very unsatisfactory sanitary condition. The absence of proper and adequate means of ventilation exists in every room. The basement is dark and damp, and, with the building close to the ground and the floors old, demands some radical remedy involving a very considerable outlay. Indeed, such an old-time building can doubtfully ever be made over into a satisfactory school building.

THE NORTH WARD SCHOOL

is simply a primitive building with no pretensions to being even moderately equipped as a school. The door was open at the time of my visit and the air good, but in cold weather and a full school it would necessarily be detrimental to the health of the pupils. The closets were of the same primitive privy type and similarly to be condemned.

THE SOUTH WARD SCHOOL BUILDING.

The situation, as well as the very old building are such as to demand a prompt remedy on the part of the Board. The privies are filthy to a degree, while the dark crowded rooms,—with no attempt at adequate ventilation,—are such as to call for a recommendation on the part of the Inspector that the town be deprived of its government grant if pupils are to be longer condemned to attendance in such a place.

It is apparent both from what I have seen and what I learned in conversation with your Board that the situation I have described is one which has been looked upon by yourselves and citizens as demanding a prompt remedy.

Contagious diseases have existed to an unusual degree amongst the school children during the past year, and while there may have been in some instances a recurrence of cases owing to children returning to school too soon after sickness, yet the condition of the school buildings is such that any attempt to cleanse and disinfect them must prove difficult, while the crowding and lack of ventilation must make the dissemination of disease from one pupil to another almost inevitable. In so progressive and well-to-do a town as Paris the time seems to have arrived when a large new public school building or buildings must be supplied, with a sufficient air space for each pupil, and equipped with some modern mechanical means by which an adequate amount of warmed fresh air supplied with normal moisture can be introduced. It is daily being brought home to parents, teachers and physicians that the school becomes to a larger degree than any other, the cause of general ill health, short-sight, and contagious disease in our children,—who, for at least ten years of the formative period of their lives are required to spend so many hours within them. If compulsory education is demanded it seems clearly the duty of those in charge of our schools to make the conditions of school life an aid rather than a hindrance to the physical and mental growth of our children.

I have the honor to be,

Your obedient servant,

P. H. BRYCE,

SECRETARY PROVINCIAL BOARD OF HEALTH.

REPORT ON THE INVESTIGATION MADE INTO THE CONDITION OF THE GRAND TRUNK CATTLE YARDS AT THAMESVILLE.

By P. H. BRYCE, M.A., M.D.

Sept. 5th, 1899.

Mr. Chairman and Gentlemen of the Provincial Board of Health :

GENTLEMEN,—The Board, as seen in the correspondence herewith submitted, having been called upon to investigate the condition of the cattle yards of the Grand Trunk Station at Thamesville, your secretary, with the consent of the Minister, proceeded to Thamesville, and, on Sept. 5th, 1899, made, in company with the reeve, several members of the local board of health, and the board's solicitor, an investigation of the said cattle yards.

We found the situation as follows :—On the railway reservation, within 100 feet, or thereabout, of the passenger station are the cattle yards, consisting of a weigh yard 18 feet by 42 feet, and a yard proper 68 feet by 48 feet, surrounded with a tight board fence 5 feet high and floored in part with old railway ties, the balance, about one third, being thinly covered with cinders. From this yard is a gateway with inclined plane leading to the cars. Along the fence to the south are two tanks or water-troughs raised two feet from the ground to hold water for cattle, while lying loose in different parts of the yard were six ordinary V-shaped wooden pig-troughs. The floor of ties has depressions in it in all directions, leaving an uneven surface whereindung and food thrown out of the troughs can accumulate, and more or less of such—dried or drying—covered the whole area, giving out an effluvium most disagreeable, as it always is from pig manure. No pigs were in the pen when visited. While there is a fine railway water-tank supply just across the tracks, no conveniences for washing down the yards exist, and if there were there is no drainage from the yards.

On information from the Board, as also from the railway agent, it appears there is, besides cattle and sheep, an average of two to three carloads of hogs collected in the yards and shipped weekly. About 150 to 160 hogs make up a car-load. They are usually shipped twice a week, on Mondays and Thursdays.

It is hardly necessary for your secretary to state that under the conditions described a serious effluvium nuisance exists. Residences of villagers are across the road from the yards, and one witness living within a block stated that some nights after a hog-delivery day, it was necessary on a hot summer evening to close the house windows to prevent sickness and nausea from the odors.

Therefore, on investigation being satisfied as to the existence of a "nuisance and unsanitary condition," your secretary, as provided in section 72 of The Public Health Act, would recommend to the board as follows :—

1st. That as provided in sub-section 2 of section 72 of chapter 248, R.S.O., 1897, the Local Board of Health of Thamesville be supplied with a copy of this report, also the Grand Trunk Railway authorities through their agent in charge of the premises, and farther, that a copy be transmitted to the Minister of the Department to which this Board is attached.

2nd. That under section 29 of the same Act, cap. 248, R.S.O., 1897, the Local Board of Health of Thamesville be instructed to have the nuisance abated as provided in sub-section 2, section 72, chapter 248, R. S. O., 1897.

RECOMMENDATIONS.

In lieu of the removal of the cattle-yards to a more distant portion of the Grand Trunk property, of which the company possesses a large acreage to the west of the village, your secretary would recommend as a suggested mode of abatement of the nuisance :

1st. That the company lay a concrete or asphalt floor on the top of the present bottom, having previously laid five rows of field tiles to prevent the heaving of the cement in winter.

2nd. That from the floor the manure and filth be removed after each shipping-day in barrows or carts to some proper field, and there plowed under.

3rd. That a hydrant with proper hose attachments be provided so that the floor may be regularly flushed, and that the drainage therefrom be carried to a shallow covered tank, whence it may be pumped or carted away to fields or gardens ; or else that from the tank, provided with a valve, the sewage be discharged into a drain emptying finally into sub-surface field tiles of sufficient capacity to hold the contents of the tank—this being quite possible owing to there being a lower excavated area of land on the railway property to the east.

As the Public Health Act provides for an application to the High Court for an order to restrain the proprietors from carrying on the shipping business until the nuisance is abated, it will be the duty of the local board of health of Thamesville to formally give notice to the company to have the nuisance abated within a specified period, after which it may make application to the Court.

All of which it respectfully submitted,

(Signed) PETER H. BRYCE,
Secretary.

REPORT *RE* VENTILATION OF BRASS WORK SHOPS.

By P. H. Bryce, M.A., M.D.

December 8th, 1899.

To James R. Brown, Esq ; Inspector of Factories, Department of Agriculture, Toronto, Ont.

DEAR SIR,—Replying to your letter of the 30th ult. regarding the condition of the brass foundries I visited with you on Tuesday, the 28th ult., I would say that in the Coulter factory the fan utilised in the cellar flat served to maintain the air there in a very good condition. With regard to the flat above the most objectionable part of the work carried on there is the brass polishing or buffing. The windows being open on the warm day, the dust from the brass grinding and polishing was moving generally away from the men ; but on a colder day the air of the room, some 12 x 12 feet, must become laden with particles of brass dust which English authorities are agreed are, along with other metallic dusts, the cause of very many cases of chronic phthisis, bronchitis and asthma in very many workers, (See Dr. Greenlaw and Dr. Arlidge, English Reports on Trades Injurious to Health).

In 1894 Dr. R. M. Simon, Birmingham, England, dealt especially with the subject of the prevalence of disease amongst the many brass workers there. He says brass workers rarely attain old age, and provident societies formerly either altogether refused to enroll them or accepted them only at increased rates. "Brass ague is common with those who deal with the molten metal, while those in shops with much dust or acid fumes are liable to bronchitis and asthma."

In the Booth factory the open forges in room with low ceilings, burning coke and charcoal, while having hoods suspended over the fire, were even with open doors irritating to the throat ; and when it is remembered that carbonic oxide is given off with the blue flame and is the most poisonous constituent of all water gas which causes so many fatal accidents, it is apparent that systematic means should be adopted in every case, where such forges and brasiers are operated, for rapid removal of gas by fans and the introduction of fresh air into those work shops.

I would therefore advise that a routine order be promulgated requiring systematic fan ventilation in all such shops. The buffing room in the Coulter factory should have a good extract pipe to draw its air to the fan now in the basement as a blower to the furnace. The Booth factory can by a similar attachment from the buffing room cause the dust to be drawn into the extract shaft of the fan now being put into place.

I have the honor to be,

Your obedient servant,

P. H. BRYCE,

Secretary Provincial Board of Health.

TORONTO, December 8th, 1899.

ANNUAL REPORTS

OF

LOCAL BOARDS OF HEALTH.

BELLEVILLE.

REPORT OF DR. R. TRACY, MEDICAL HEALTH OFFICER.

BELLEVILLE, ONT., December 8th, 1899.

To His Worship the Mayor and Council of the Corporation of the City of Belleville :

GENTLEMEN,—I have the honor to submit the annual report of the Board of Health for the year ending 30th day of October, 1899.

The Inspector made the usual house-to-house inspection of the city, and, when occasion required, I visited personally with him any case requiring investigation ; the citizens generally complying with the orders made by the Board.

Had analysis made of the city wells and found them generally good ; when not so, had them thoroughly cleaned out and any unsanitary state corrected.

There has been a large number of cases of scarlet fever during the year. The disease has been prevalent over Canada and the United States. In all, 108 cases and 2 deaths have been reported. The houses have been placarded, and I personally saw to the thorough disinfection of a number of them.

Typhoid fever—14 cases, with four deaths. Ten of these were contracted outside the city.

Diphtheria—9 cases, with 3 deaths.

Whooping cough has also been prevalent, but no deaths recorded. As soon as a case was reported had the children prevented from attending school.

Chicken-pox has also been prevalent, and the same precautions have been taken. No deaths reported.

The number of deaths reported from contagious diseases, has, taking it in all, been very low. I had thought I had scarlet fever stamped out, but during the summer holidays, and owing to disease being of such a mild type, numbers of families had cases in which no physician was in attendance, and allowed the children to mix with others, thus causing the disease to spread, but now believe the trouble to be abating.

Milk licenses to the number of 66 have been issued by me, and from the beginning of the year the milk will be regularly tested and byres inspected.

The Inspector has faithfully carried out his duties, much to my assistance and satisfaction.

Respectfully submitted,

R. TRACY,

Medical Health Officer.

BRANTFORD.

REPORT OF DR. F. G. E. PEARSON, MEDICAL HEALTH OFFICER.

BRANTFORD, November 1st, '99.

To the Chairman and Members of the Local Board of Health :

GENTLEMEN,—I herein present to you a report of the Sanitary Department of the city for the year ending October 31st, '99.

Mortuary Statistics.—The number of deaths, exclusive of still births, registered at the City Clerk's Office during the past twelve months was 239, which is estimated popu

lation of the city, as taken from assessor's report of 17,344, gives a mortality rate of 13.78 per thousand.

The causes of death were :

Scarlet fever.....	4
Typhoid ".....	16
Diphtheria and croup.....	2
Tuberculosis and phthisis.....	29
Pneumonia.....	17
Meningitis.....	9
Cholera infantum.....	9
All other causes.....	153

Two cases of typhoid occurring at the hospital of patients outside of the city.

The ages were :

Under 1 year.....	45
" 5 ".....	59
Over 60 ".....	67
" 80 ".....	16

Scarlet Fever.—Commencing at the close of '98, there has existed more or less of an epidemic of scarletina through the year, which for the most part was of a very mild type, and almost confined to one section of the city ; resulting in the infection of 82 homes, with 110 cases, and 4 deaths. The monthly rate of cases are as follows :

Nov. 18, Dec. 11, Jan. 2, Feb. 1, March 8, April 15, May 11, June 17, July 2, Aug. 5, Sept. 9, Oct. 11.

and as set forth in my last report to this Board, due largely to the infection of the School by children who from the extreme mildness of the disease, had never required the aid of a physician, and were thus allowed to go unreported and unisolated to carry infection where it would more rapidly develop, and which required much work to search out those who were the cause of the trouble, and have them sent home and isolated.

Then there was the difficulty of enforcing the required quarantine at the homes of those who in a few days were well enough to be about long before the period of infectiveness had elapsed ; more particularly was this the case in the warm summer months ; and although in many cases carelessness existed and the delinquents prosecuted, there were others in which it was impossible to expect efficient isolation, etc., when such limited means of doing so existed in their homes.

Again was it noted that although disinfectants were supplied, in many cases they were not properly applied, and thus reoccurrences were frequent. All of these alone with many other indifferences to the precautions that should be regarded in dealing with such diseases, brings up again the absolute need of an Isolation Hospital. For the proper care and isolation of these contagious diseases which cannot be successfully combatted without, and at the same time relieve many of our citizens from the expense and inconvenience which they are subjected to in trying to carry out in their own homes the required isolation, etc., that such an hospital should provide. I would, therefore, once more urge upon this Board, that no effort be spared to have at once, either by contract with the Hospital authorities, or otherwise, some means of effectually dealing with these diseases.

Typhoid Fever.—Including with typhoid those cases of doubtful character and reported as fever and suspected typhoid, some few of which are probably malarial, there has been reported from the city, during the last year in all 154 cases, with 14 deaths occurring as follows :

Cases.—Nov. 5, Dec. 2, Jan. 0, Feb. 1, March 0, April 0, May 1, June 1, July, 7, Aug. 59, Sept. 54 Oct. 23.

Deaths.—Nov. 1, Dec. 1, Jan. 0, Feb. 0, March 0, April 0, May 1, June 0, July 0, Aug. 4, Sept. 2, Oct. 5.

Excluding from the above, five cases had their origin outside the city, there occurred in wards No. 1, 34 ; No. 2, 33 ; No. 3, 25 ; No. 4, 15 ; No. 5, 42, and since the chief causes of typhoid are generally to be found as the results of hot and prolonged dryness of the season, the want of pure drinking water, and the lack of proper disposal of sewerage, etc., or more properly all combined, which I think is borne out in the above cases, for upon analysis we find that almost all the above cases occurred after the very dry summer

when all the wells became low, and although a few cases were scattered more or less generally over the city, the great majority were located in those districts where the source of water supply was chiefly from the wells, and where drainage and proper disposal of sewerage is wanting, seen especially in West Brantford, Eagle Place, and the northern part of ward 2, and again regarding the water supply, 90 were well, 26 well and city, and 32 city water users, and with regard to the city water users in almost every case was local causes sufficient to produce the disease, as for example, 8 cases occurred where defective and foul cisterns ventilated themselves into the cellars, 3 others occurred in a house where the sink discharged into the cellar, etc., etc. It has also been found from a series of tests of well water taken in various parts of the city, that it was almost universally contaminated with organic matter and sewerage, thus the probable source of disease. While we were at the same time assured from repeated tests by J. J. McKenzie, Provincial Bacteriologist, of the good standard of purity of the city supply.

Therefore, regarding the mitigation of typhoid, it was recommended that where the public supply could not be obtained, all well water used for drinking purposes should be boiled. That there should be a general extension of the city supply in those localities not yet supplied; and an enforced closing of all wells in infected districts, and furthermore, that in those parts of the city not yet supplied with a sewerage system should be attended to as soon as possible; and in this I refer particularly to the eastern part of Wards 4 and 5, where a trunk sewer should be extended along Rawden street, also West Brantford and Eagle Place, which, although probably requiring a pumping system, should nevertheless be provided for.

Diphtheria and Croup and Measles.—Of diphtheria and croup, there were reported for the period of this report in all 20 cases, with 2 deaths, both of which resulted from croup. There were 8 cases of measles and no deaths.

Milk Supply.—Regarding this product, which is so extensively consumed by the community, in its raw state, especially by the infant class, we have been mindful not only that a proper food standard is maintained, but also that it may not become a means of conveying contagion, in which unfortunately it sometimes plays a part. And regarding this latter it now seems very probable that, apart from other diseases, whose germs find in it a suitable breeding ground, milk is largely responsible for many cases of tuberculosis, as is shown by many investigations upon milk supplies, as per example in the city of Berlin, where 28 per cent. of the supply of the city was found to be infective, while the other investigations show such milk to be infective to animals from 5 to 55 per cent. of cases, etc., and I am pleased to see that this board, seeing the wisdom of enforcing the tuberculin test a year ago upon the herds supplying milk to the city (out of which eleven cattle reacting to the test were slaughtered, and upon post mortem revealed distinct tuberculosis) are in future insisting upon an annual test of all herds from which the city is supplied, and demanding a clean bill of health of such herds before permits are granted.

Garbage System.—As dealt with in previous reports, I must again remind you that the city has outgrown the present haphazard means, and has arrived at a period when some thorough and systematic means for the collection of garbage and house refuse should be inaugurated, and to this end I would suggest that this board recommend the council to provide three or four suitably constructed wagons or carts, under the management of the Streets Department, to make weekly and semi-weekly rounds in the various parts of the city to collect such refuse which is placed on the streets in suitably covered boxes by the householder between the hours of collection on his street; then that which is inoffensive could be used for filling-in purposes in dumps, which then could be controlled and kept in proper shape, while that which was offensive should be cremated.

SANITARY WORK.

Although somewhat delayed in this work during the first part of the year, on account of the urgent demand upon the Police Department, from which the sanitary inspector is supplied, a fair amount of work was accomplished, and is as follows:

Sanitary Inspector's Report.—Besides a thorough inspection of 31 dairies supplying the city, numerous milk tests were made. A house to house inspection in which, besides 262 irregular inspections for contagious diseases, etc., 675 premises and houses were

thoroughly gone over. Two hundred complaints were investigated, and where nuisances existed orders issued to abate such. Twenty prosecutions were made for violaters of the Health Act, and in each case convictions were obtained; 138 privy pits were cleaned and filled up and substituted with dry earths or water closets; 62 wells were cleaned; 36 sewer connections were ordered in. Along with the above was the disinfection of schools and houses with Formaldehyde for contagious diseases.

Recommendations.

1. That the fire hall be connected with sewer.
2. That the creek running through Wards 4 and 5, emptying in canal at power house be cleaned.
3. That a ditch or drain be placed on Washington street to keep surface water from flooding the premises below Terrace Hill.
4. That persons that collect swill and garbage should have a light waggon-box with cover, so that the contents may be kept from being offensive on the street.
5. That sewers be placed on Alfred street, between Wellington and Nelson; also on James street, between Brant avenue and Pearl streets.
6. That the closets in Vanstone's lane, rear of George street, be all connected with sewers.

CHATHAM.

REPORT OF DR. W. R. HALL, MEDICAL HEALTH OFFICER.

To the Chairman and Members of the Chatham Local Board of Health:

GENTLEMEN,—I herewith submit my annual report for the year ending December 31st, 1899.

Scarlet fever was reported as follows :

January	5 cases.
February	3 "
March	1 "
April	3 "
Total	12 cases.

Diphtheria was reported as follows :

August	1 case.
September	2 "
October	7 "
November	3 "
December	1 "
Total	14 cases.

It is a source of congratulation that there were no deaths and so few cases of contagious disease, when we consider the fact that there were two distinct outbreaks of scarlet fever and at least four outbreaks of diphtheria.

This favorable condition of affairs is due chiefly to these two factors, the physicians of the city recognizing the disease early and report them promptly, and the excellent facilities for isolating patients afforded by the isolation wards connected with the General and St. Joseph Hospitals of the city.

These wards are of great advantage not only to the city, but the adjoining municipalities in stamping out contagious disease.

Fourteen deaths were reported from consumption. Four of these were patients brought into the hospitals where they died, but did not at any time belong here. The death rate from this preventative disease is very high, about 1 in 1000.

The total number of deaths recorded was 169, but 10 of these were hospital patients from outside municipalities, so that our true death rate was 15.9 in 1000 or 1.59 per cent.

Typhoid Fever.—Only 11 cases of typhoid fever were reported, all of which recovered. The typhoid cases seem to occur among the users of well water only, and I would suggest as the best means of stamping out, or at least limiting, this disease the extension of the water works to all parts of the city, and encouraging by a low water rate all citizens to

use it. One hundred and sixty-eight new connections were made with the water works during the year, and five wells were closed because the water was found unfit for use.

Building Condemned.—A number of dwelling-houses reported by the inspector as unfit for human habitation were carefully examined by committee of the Board of Health, and six dwellings were condemned by the Board, four of which were torn down and two were repaired.

Health By-laws Revised.—Section 1, Schedule B, amended re examination of well water and condemnation of well water if found bad.

Rule I., Schedule A, Section 14, requiring the city engineer to send in a list of sewers in the city fit to make closet connections with.

Rule V., Schedule A, Section 14, amended by inserting 1st instead of 15th in the third line.

Rule VI., Schedule A, Section 14, amended by inserting April instead of May in the fifth line.

Rule VII., Schedule A, Section 14, amended by making it apply to keeping of hogs the whole year, and increasing the distance to 100 feet from dwellings, streets or streams.

Rule VIII., Schedule A, Section 14, amended by striking out 15th of May and 1st of November and inserting 15th of April and 15th of November.

And a by-law defining where ice may be cut for the city, forbidding the use of McGregor's Creek and all parts of the river except east from a point 150 feet east of the foot of Seventh Street.

Slaughter Houses.—Slaughter houses are not permitted in the city, but five slaughter houses used by the butchers of the city are regularly inspected and are in a satisfactory condition.

There have not been any complaints of diseased meat, fowl, or fish on the market this year.

Milk Supply.—All cows are licensed by the Board after being inspected first by the inspector, and if he reports any cows suspicious they are then examined by a veterinary surgeon employed by the Board. Licenses are not granted unless the conditions laid down are complied with. The milk is subject to examination at any time. This year it was found to be well up to the standard in every case.

There were only two prosecutions under the by-laws, both of which were successful.

WM. R. HALL,
Medical Health Officer.

HAMILTON.

REPORT OF DR. ISAAC RYALL, MEDICAL HEALTH OFFICER.

Hamilton, Ont., November, 1899.

To the Chairman and Members of the Local Board of Health:

GENTLEMEN,—The sanitary condition of the City for the year ending 31st October, 1899, shows a marked decrease in the number of cases reported of diphtheria and scarlet fever.

This year, diphtheria cases number 102, with 13 deaths, against 162 cases, with 20 deaths, the previous year, showing a decrease of 60 cases.

Scarlet fever cases number 123 cases, with 5 deaths, against 214 cases and 10 deaths, giving a decrease of 91.

Seventy-four cases of typhoid fever, with 14 deaths, were recorded against 37 cases, with 6 deaths, in 1898. This increase was possibly due to the very dry season, although the latter could have had no influence over the water supply such as exists in country places.

Fourteen cases of diphtheria were reported from the Boys' Home which were imputed to the offensive odors emanating from the manholes in the streets. The sewers have been frequently flushed and lately were found to be in a clean condition by the ward foreman. I think it would be better to close the manhole openings and have a ventilator placed higher up the street. Two cases were also reported from the Girl's Home ; all the cases were sent to the Isolation Hospital.

Other contagious diseases reported were : chicken pox, 43 cases ; measles, 36 cases ; whooping cough, 109 cases, with 7 deaths ; and mumps 38 cases.

Our citizen mortality has been less by 56 cases. Last year the total deaths were 710, one death not having been reported until the following month, after my report was sent in ; the deceased was buried elsewhere which accounts for the omission.

The deaths for the year past number 653 ; males, 329 ; females, 324. The population as given by the assessors was 51,011 ; this gives a death rate of 12.82 per 1000. Total still born, 47.

I noticed a few discrepancies in the registration of deaths given by physicians and the cause of death given to the cemetery, which would indicate that the law relating to burials has not been fully complied with, notably that which requires the Registrar's certificate before burial, which is a very important item.

There were 19 deaths recorded from accidents, of which 7 were from drowning ; also 3 railroad, and 9 from other causes.

Deaths of children under 5 years number 168 ; of this number 119 were under one year, several surviving only a few hours.

The mortality from consumption still ranks high ; about 68 cases reported this last year. It is to be hoped that the philanthropic efforts used to avert the disease will prove beneficial, if not altogether effective.

Respectfully submitted,

ISAAC RYALL,

Medical Health Officer.

Summary of the work of Milk Inspector L. A. Macdonald.

Number of licenses issued good to 30th April, 1900.....	218
Samples collected and tested	421
Shops inspected	1,007
Dairies inspected.....	148
Cow byres inspected	163
Cow byres found in dirty condition	179
Cows found in dirty condition	3
	1

Summary of Sanitary Inspections, John Peacock.

Number of inspections made	7,160
“ of privy vaults notified to be cleaned.....	665
“ “ permits issued to contractors.....	1,007
“ “ given for	17
“ “ abolished	72
“ cesspools, permits issued to contractors	35
“ “ given for new ones.....	5
“ “ abolished.....	9
“ dry earth closets, notified to clean.....	24
“ sewer connections, notified to make	22
“ “ found defective.....	141
“ foul drains, to abolish.....	11
“ stagnant water, to abolish.....	14
“ dirty premises, to clean.....	14
“ other nuisances, to abate.....	779
“ old wells filled in	2
“ houses placarded for infectious diseasee.....	168
“ “ fumigated by inspector.....	176

Burials in Hamilton Cemetery.				Holy Sepulchre.				Distant burial grounds.				1898-1899.				Contagious diseases by months.												
1899.	No. of interments.		Citizen mortality.	Citizens.			Citizens of all denominations.			Combined mortality.			Month, 1898-1899.	Diphtheria.	Scarlet fever.	Typhoid fever.	Measles.	Whooping Cough.	Chicken Pox.	Mumps.	Total.							
	Total burials.	Non-residents.		Total.	Males.	Females.	Still-born.	Total.	Males.	Females.	Citizens.	Males.										Females.	Still-born.					
Monthly obituary.				Total.	Males.	Females.	Still-born.	Total.	Males.	Females.	Still-born.	Citizens.	Males.	Females.	Still-born.	November	December	January	February	March	April	May	June	July	August	September	October	Total.
	38	6	5	2	2	3	1	2	32	17	15	5	22	6	3	9	8	9	5	3	7	11	23	15	1	1	63	
	51	10	9	10	7	3	1	2	48	27	21	9	9	4	1	3	1	3	3	1	3	7	61	30	1	1	18	
	64	8	1	8	5	3	3	11	2	9	74	30	44	1	1	19	4	4	4	4	4	4	4	4	4	4	45	
	60	12	3	14	8	6	7	2	66	32	34	3	8	14	1	5	5	5	5	5	5	5	5	5	5	5	38	
	53	6	5	7	3	4	13	11	2	62	39	23	5	5	6	1	1	1	1	1	1	1	1	1	1	1	21	
	42	10	2	10	5	5	2	1	42	22	20	3	42	20	1	3	3	3	3	3	3	3	3	3	3	3	3	
	37	7	2	9	4	5	1	2	41	16	25	2	41	16	25	2	41	16	25	2	41	16	25	2	41	16	25	
	45	13	2	13	7	6	8	5	51	29	22	2	51	29	22	2	51	29	22	2	51	29	22	2	51	29	22	
	47	7	7	14	6	8	2	10	5	59	33	26	3	59	33	26	3	59	33	26	3	59	33	26	3	59	33	26
	74	7	7	60	29	31	4	9	5	83	40	43	8	83	40	43	8	83	40	43	8	83	40	43	8	83	40	43
	47	14	3	16	11	4	7	2	7	5	1	1	51	22	29	3	51	22	29	3	51	22	29	3	51	22	29	
	43	8	4	15	3	1	2	1	10	6	4	1	44	22	22	6	44	22	22	6	44	22	22	6	44	22	22	
	601	108	37	456	231	225	6	87	41	46	4	653	329	324	47	102	123	74	36	109	43	38	525					

COMPARATIVE STATEMENT OF DIPHTHERIA, SCARLET FEVER, TYPHOID FEVER.

	1898.	1899.
Diphtheria	162	101
Scarlet fever	214	123
Typhoid	37	74
Diphtheria being 60 cases less ; scarlet fever being 91 cases less ; typhoid being 37 increase.		

LONDON.

REPORT OF DR. T. V. HUTCHISON, MEDICAL HEALTH OFFICER.

January 2nd, 1900.

To the Chairman and Members of the Local Board of Health.

GENTLEMEN: I have the honor to submit the following report upon the sanitary conditions of the city, and other matters relating to the public health for the year ending November 15th. It is to a certain extent supplementary to reports already laid before you. The sanitary condition of the city was never better. This will readily be seen by the small number of deaths due to preventable diseases, such as typhoid fever. All of the infectious diseases were of mild types.

Four hundred and ninety-nine deaths took place during the year, exclusive of twenty-four (24) still-born. Of this number consumption caused the deaths of fifty-six, and pneumonia forty-three. These two diseases of the lungs took off ninety-nine persons, or one-fifth of the whole number. Heart disease and heart failure are given as the cause of fifty-seven deaths.

There were three hundred and sixty-three cases of infectious diseases reported in the year. They were of mild types, there being only twenty-three deaths, as follows: Scarlet fever 238 cases, and eight (8) deaths; diphtheria 71 cases with nine (9) deaths; typhoid fever 54 cases and six (6) deaths. Of this number 180 were attended at the city hospital, and twenty-nine at St. Joseph's. The mortality from infectious diseases, it will be seen, was extremely low. The death rate for the year was 12.7 for every 1,000 of the population. There were only six deaths from typhoid fever, the lowest number for many years. This may be taken as evidence of the cleanly state of the city.

La grippe caused the deaths of seventeen and cancer twenty-seven. The latter disease is becoming more prevalent every year, not only in this city, but in the whole province. With the exception of scarlet fever, diseases of infants and young children were few. There were only eight deaths from cholera infantum, two from croup, one from whooping cough, and one from chicken pox. The number of deaths due to inflammation of the lungs was large, the disease in elderly persons being a sequence of or complicated with la grippe.

Leaving out the disaster at the City Hall there is an increase over former years in the number of deaths by violence, viz.: twenty-one (21). It will be comforting to those turning the four score mile post to know that the comparatively large number of twenty-one (21) deaths are credited to old age, their years ranging from eighty-five (85) to ninety-nine (99) years. No epidemic visited the city. Although small-pox has appeared in several of the neighboring municipalities, London is still free from it.

Of the two nurses who were under contract with the Board to attend cases of this disease should their services be required, one is dead and the other "non est." So soon as safe and competent nurses can be found they will be engaged.

The inspection of herds, dairies, and milk supplied the city during the year, has been very carefully done. Ninety-seven herds were inspected and one hundred and twelve samples of milk collected by the inspectors, were examined. One sample was adulterated by removal of cream, and three had cream added. By reason of the dry summer and autumn the quality of the milk was unusually good, the average per cent. of butter-fat being over four, or to be exact, 4.17 per cent. Chiefly to this and pure water may be attributed the small number of deaths among infants. Cancer was found in the owner and caretaker of one of the herds. The sale of milk from this dairy was promptly stopped. Another had his milk license cancelled for unclean premises.

The public schools of the city are periodically inspected as to their sanitary condition—heating, lighting, ventilation, and the health of the pupils.

The action taken by the Board of Health in notifying physicians and heads of families neglecting to report all cases of infectious diseases coming under their notice, would be prosecuted, has had a good effect, as the large number reported will show. It is through the public schools that much of the scarlet fever is spread. A child who has a sore throat or some slight ailment for which it is not necessary to consult a physician, is kept home a few days, and then sent back to school to give scarlet fever or diphtheria

to his or her classmates. It is in the power of three classes of people to reduce the number of cases of infectious diseases to a minimum, viz.: physicians, parents and teachers. No fault can be found with the latter. They conscientiously do all in their power to keep infection out of the schools.

Early in the year the city council determined that under the Municipal Improvement Act, no more plank walks should be put down, and that all walks laid should be permanent ones. This was a move, and a very proper one, in the right direction, for which the council deserve the thanks of the citizens. Rotting wooden pavements are insanitary, vile smelling, and in no way conducive to the public health.

The population of the city is now 39,000.

OTTAWA.

ANNUAL REPORT OF DR. A. ROBILLARD, MEDICAL HEALTH OFFICER.

Ottawa, 12th December, 1899.

To the Chairman and Members of the Local Board of Health.

Gentlemen,—

I beg to lay before you the Annual Report of the Health Department for the year ending October 31st, 1899.

The past year, I am pleased to say, has not been marked by any serious outbreak of epidemic disease of any kind. Smallpox, which during last winter made its appearance, at three or four different points within the province, we have fortunately escaped, thanks to the steps taken by the Provincial Health Authorities, to prevent the spread of that loathsome disease.

The total mortality for the twelve months comprised in this report, as shown in table 1, here appended, has been from all causes 1173, exclusive of still births.

In appreciating the mortuary statistics of this city, we should not overlook the fact that over and above the deaths of residents of the city these figures include as a not inconsiderable number of fatalities occurring among non-residents who came here from the surrounding districts to be treated in our hospitals, and succumbed to their maladies, especially is this the case as regards such infectious diseases as Scarlet Fever, Diphtheria and Typhoid Fever, originating in the surrounding suburbs of the City. Then again, these figures also include the death roll of the Foundling Institution, the inmates of which are received from all over, and even beyond the limits of this province.

Did we exclude all such outside cases, as is sometimes done in other cities we could easily reduce rate to 18 per thousand or possibly less. The figures above given represent the number of burial permits issued by the registrar during the twelve months ending on October 31st and consequently include all the deaths that occurred in the City during that period.

With our estimated population of 58,000 this gives us a death rate of 20.2 per thousand of the population, which under existing circumstances is a fair showing. Out of the total mortality 517 deaths were of children of five years of age and under including the mortuary records of the House of Bethlehem, which are given in Table IV here attached. As usual the chief causes of mortality among children have been Diarrhoeal and other diseases incident to dentition, which during the summer months, more than decimate the infant population, and infectious diseases such as scarlet fever and diphtheria, a certain number of which cases we have always with us. Among adults, by far the largest factor in our death roll is consumption with its ever increasing quota of yearly victims. Typhoid fever, which is also a yearly visitor, made its appearance last season somewhat earlier than usual, it as well as other diseases were slightly in excess of the previous year. That the causation of such maladies is often due to the unhealthy conditions of the dwelling house or surrounding premises or both, cannot be reasonably disputed, nor can it be justly denied, that aside from the reckless indifference of many individuals as regards these sanitary matters, other reasons did exist which in many instances, were largely contributory to the causation of such insanitary conditions.

The want of proper sewers in a large section of the City, the want of a public system of scavenging, and lastly the want of sufficient help in the Health Department to exercise power supervision over and enforce cleanliness throughout the city were undoubtedly large factors in their existence. The want of drainage, I am glad to say, will be remedied in the near future by the completion of the main sewer now in process of construction.

With regard to a public system of scavenging to effect the proper disposal of household refuse, that I regret to state is not yet in view, nor will it ever be inaugurated to comply fully with the laws of sanitation until the city has an incinerator to effect the destruction of all garbage subject to rapid decay. The number of infectious diseases reported to the Health Authorities during the past year are shown in Table III here attached. That the isolation hospitals have done good work during the year is evidenced by their records as they appear in Table II here appended.

The regulations of the local Board of Health in relation to the ice supply of the city for household consumption have been complied with during the past year, except in one instance, which in no way endangered the public health in so far as that article was concerned.

But few samples of milk were tested by me during the past year. Judging however from the fact that it is very seldom indeed any complaint is made about that very generally used article of food, it can be safely inferred that our milk supply is generally good.

For the work more immediately under the control of Sanitary Inspector, Mr. Cawthray, I beg to refer you to that gentleman's comprehensive report here attached.

Respectfully submitted,

(Signed) A. ROBILLARD, M.D.

Contagious Diseases.

	Protestant Annex.			R. C. Annex.		
	Diphtheria.	Scarlatina.	Measles.	Diphtheria.	Scarlatina.	Measles.
Admitted during the year.	72	62	..	109	52	2
Discharged " "	59	59	..	99	52	2
Deaths " "	7	..	..	10	..	..
Nine of the above recorded cases were from outside the city.				Thirteen of the above recorded cases were from outside the city.		

N.B.—It is but fair that I should state that in a number of fatal cases above recorded the death occurred within twenty-four hours, the patient being taken to the hospital in a moribund state.

Showing number of infectious diseases reported during year 1899.

Diseases.	No. of cases.
Diphtheria including croup.....	102
Scarlet fever.....	138
Typhoid fever.....	308
Measles.....	15
Total.....	463

Record of the House of Bethlehem for year 1899.

How disposed of.	No. of cases.
Admitted during the year.....	257
Placed outside or returned to parents.....	137
Died during the year.....	103
Remaining in house on November 1st, 1899.....	17
	257

Sanitary Inspections.

I beg to submit for your consideration my Annual Report showing the work done in the sanitary department during the year ending October 31st, 1899.

In addition to the work in tabulated form undermentioned there have been :

162 houses disinfected ; 50 cards put up ; 40 cards taken down ; 26 drains tested for defective plumbing ; 167 written notices to property owners, tenants and others, the balance verbal ; 6 summonses were issued in every case of which a conviction was obtained ; 3,252 privy vaults cleaned.

Dumping grounds.—The two dumping grounds owned by the city have received due attention and the general absence of complaint certifies to the effective work being done.

The various trades.—The inauguration of the inspection of the various trades which may become offensive has been entered upon this year, resulting in sanitary improvement in several establishments and the closing up of business in three instances.

Dairy farms.—A systematic inspection of the dairy farms has been made this year. I visited last winter forty-two dairy farms situated mostly in the township of Gloucester, Hull and Nepean. Apart from the number of nuisances mentioned in the table, I found that the majority of the cows were not cleaned or groomed as well as they should, and also a want of proper milk storage in winter, separated from contamination from the dwelling, existed extensively.

Inspection of yards.—Owing to the small staff, this part of the work has not received the attention it requires, but what has been done proves without the need of a scavenging system or at least more assistants to force individual efforts to remove nuisances.

Plumbing. The very small percentage of the complaints registered at the Health Office relative to defective plumbing shows that on the whole the work done in this city must be of a substantial nature.

Supervision of ice cutting. A new feature in the supervision of ice cutting has arisen owing to dealers in the suburbs of Ottawa East, Tetreauville and the neighboring city of Hull becoming purveyors of ice to this city. The localities mentioned not having the safeguards required by this city, it consequently necessitates the supervision of ice cutting not only of the city of Ottawa, but also of the suburbs mentioned, as well as the city of Hull. To facilitate this matter new rules and regulations should be added to those now existing.

In conclusion I wish to acknowledge with thanks the valuable aid I have received from the chairman of the board and the Medical Health Officer in the discharge of my duties. I also willingly bear testimony to the effective work done by my sole assistant in the sanitary department.

Respectfully submitted.

(Sgd.) JOHN CAWTHRAY,
Sanitary Inspector.

Classified list of nuisances under notice of the department during the year.

Description of Nuisances.	Reported by Sanitary staff, tenants and others.
Refuse on streets, vacant lots, etc.	67
Filthy premises.	524
Illuminating gas.	9
Offensive odors from sewer gas entering houses.	20
" other sources.	40
Drains choked.	17
Sinks untrapped.	3
Soil pipes unventilated.	4
" defective.	19
Water closets broken or otherwise defective.	7
" service breaking.	10
Deficient water supply.	2
Defective waste pipes.	17
Water in cellars.	100
Roofs leaking.	5
Piggeries near dwelling or otherwise unsanitary.	30
Want of drainage.	61
Offensive trades.	5
	940

Inspection of the various trades.

Name of Trade.	Reported by Sanitary staff.		
	No. of places inspected.	No. of nuisances found.	Trade closed.
Butchers' shops and premises.	26	10	None
Slaughter houses.	4	None	None
Pork packers.	4	2	None
Junk dealers.	4	1	1
Hide dealers.	2	1	1
Tallow renderers.	2	1	1
Dairy farms.	42	19	None
Milk vendors only.	6	2	None
	90	36	3

Tabulation of dairy farms inspected.

Townships.	Samples of water collected for analysis of wells.	No. of premises inspected.	Privy too near cow byre or storeroom.	Foul store room.	Pigs in cow byre.	No ventila- tion in byre.	Well too near byre.
Hull, Nepean, Gloucester.	90	42	4	7	3	2	3

Inspections made to investigate the origin of disease, proposed drainage and other sanitary requirements.

Areas and premises inspected.	No. of houses.	Object of investigation.	Nuisances found.
Area including Wellington, Sparks, Queen and Albert streets as far east as Elgin and westerly to Concession St.....	645	Garbage and filth in yard.	49
Boteler between Cumberland and King, Elm between Rochester and Division, Wellington between Lyon and Pooley's Bridge	109	Proposed drainage.	61
College Ave., Clarence, Kent, Percy, Cooper, Cartier, Creighton, Somerset.....	4	Origin of scarlet fever.	3
.....	5	Diphtheria.	4
.....	5	Typhoid.	3
	768		120

STRATFORD.

REPORT OF DR. J. A. ROBERTSON, MEDICAL HEALTH OFFICER.

Nov. 5th, 1899.

To the Chairman and Members of the Local Board of Health:

GENTLEMEN,—Again it is my pleasure to submit to you the annual report on the sanitary condition of the city for the year ending November 1st, 1899.

The number of deaths of residents occurring in the city during the year was 86, being three less than that of last year. Consumption heads the list with 22 victims, old age 12, heart failure 5, indigestion 5, cancer 5, accident 3, diabetes 3, convulsions 3, confinement 2, asthma 2, appendicitis 2, paralysis 2, Bright's disease 2, pneumonia 2, typhoid fever 2, bronchitis 2, tubercular meningitis 1, growth on brain 1, epileptic fits 1, pleurisy 1, inflammation of the brain 1, operation 1, cholera infantum 1, suicide 1, growth in stomach 1, septicaemia 1, obstruction of bowels 1, no cause given 1. Of these Romeo Ward contributed 25, Shakespeare Ward 29. Hamlet 13, Avon 9 and Falstaff 10.

Classifying the deaths according to ages we find

That between 90 and 100	1 died as compared with	0 in 1898
80	90	7
70	80	8
60	70	9
50	60	5
40	50	5
30	40	7
20	30	13
10	20	15
1	10	5
Under one year	11	7

From the contagious diseases diphtheria, scarlet fever, whooping cough and measles there have been no deaths during the year. There were 20 cases of scarlet fever and 4 of diphtheria reported. Last year there were 32 cases of diphtheria with 4 deaths, and 17 cases of scarlet fever with 1 death.

When any case of contagious disease was reported, the premises were inspected in order to ascertain, if possible, the source of the disease, the drinking water was examined, the houses placarded to prevent communication, the schools notified, and every other possible means used to prevent the spread. Our vigilant Health Inspector deserves credit for the care and attention he has given this matter.

The milk supply, which is frequently a medium of conveying disease, has been free from blame, no case of any contagious disease having been traced to it.

Our sewerage system is making steady progress and the plant for the sewage disposal almost complete. We look forward with a happy anticipation of the success of the scheme.

We have every reason to be grateful for the exceedingly healthy condition of the city during the past year, no case of any contagious disease having been reported since June 3rd, yet notwithstanding this, I cannot conclude this report without urging upon your Board, as I have in other former reports, the desirability of some action being taken whereby some scheme may be formulated to bring about the establishment of a contagious ward or hospital. Even in time of peace it is well to be prepared for war.

Your obedient servant,

J. A. ROBERTSON.

ST. CATHARINES.

REPORT OF DR. E. GOODMAN, CHAIRMAN LOCAL BOARD OF HEALTH.

To the Mayor and Council of the Corporation of the City of St. Catharines.

GENTLEMEN,—In accordance with the requirements of the Public Health Act, I herewith submit my annual report of the sanitary condition of the City of St. Catharines for the year ending the 15th day of November, 1899.

The outbreak of a mild type of scarlatina, which occurred in October, 1898, has prevailed rather extensively during the present year, owing, in a great measure, to the apparent impossibility of securing proper isolation, and disinfection of clothing in cases of slight severity. There exists among many householders a dislike to have their residences placarded, with the inconvenience and annoyance attendant thereon. In consequence of this, it often happens that no physician is summoned, and the cases are not reported. The sanitary inspector, and the Board, have done everything in their power to stamp out the disease, and with a fair measure of success, as only a few sporadic cases are now being reported. In all 156 cases have been reported since the 15th of November, 1898, to date, with six deaths; a very small percentage of mortality.

There are now eight Miller automatic flush tanks in successful operation; and I would strongly recommend the installation of additional tanks as rapidly as the finances of the city will permit, until one is placed at the head of every lateral leading to the main trunk sewers. The advantage arising from the regular and frequent flushing of the sewers, before decomposition engenders noxious gases to poison the atmosphere is too obvious to need further reference thereto.

Your Board regrets that circumstances prevented the construction of a sewer on Church street this year, and trusts that this very necessary, and important sanitary improvement will not be overlooked by the incoming council.

You are doubtless aware that the combined efforts of your Board of Health, the Mayor and Council of the Corporation, and the Water Commissioners of the City of St. Catharines, as well as of the municipal, and health officials of the town of Welland, and the village of Merriton, failed to influence the proper authorities, to prevent the swamp lands of the township of Humberstone, and the several sewers and drains along the line of the Welland Canal, between Port Colborne and Welland, from being emptied into that body of water.

The serious results which may arise from this source of pollution cannot be ignored by those interested, as by far the chief part of the water supply of the residents of Welland, Merriton and St. Catharines is derived from the Welland Canal since the Lake Erie level has been obtained. The deposition in the canal of the intestinal secretions of a patient suffering from typhoid fever through any one of the several sewers and drains emptying into it might and probably would create a widespread epidemic of that dreadful disease among the thousands of people who derive their water supply from this source. It is quite possible that the excessively disagreeable smell and taste of the public water at St. Catharines, at present being complained of and noticed after the heavy autumnal rains, may be due in a great measure to the drainage from the swamp lands in the Township of Humberstone.

I would therefore recommend unceasing efforts on the part of all who obtain their water supply from the Welland Canal to have the sewers and drains emptying into it diverted away into Lyons Creek and other natural channels of drainage in the localities where these sewers and drains exist.

The high rate of mortality from tuberculosis, and the generally entertained conviction that the pathogenic germ which propagates it is imbedded in the sputa of persons suffering from the disease, should prompt those in authority, who have the power to do so, to prevent as far as possible the uncleanly and unsanitary practice of expectorating on the sidewalks, in the street cars and in front of the entrances to all public buildings and places of resort, and wherever the poison-laden secretion can do its deadly work on the persons of those exposed to its influence.

The Sanitary Inspector and Secretary of the Board of Health have faithfully discharged their respective duties. Their reports are herewith submitted. On consulting the accompanying report of the Secretary it will be observed that the number of deaths from all sources occurring in the city from the 15th November, 1898, to the 15th November, 1899, was 185.

Deducting from this number the deaths from accidents and premature births, 17 in all, I find that the rate of mortality, based upon a population of 10,039, is 16.29 per 1,000 of the inhabitants.

Respectfully submitted,

E GOODMAN,

Chairman Local Board of Health,
St. Catharines.

WINDSOR.

REPORT OF DR. J. COVENTRY, MEDICAL HEALTH OFFICER.

WINDSOR, ONT., Dec. 1st, 1899.

To the Mayor and Council of the City of Windsor :

GENTLEMEN,—As I was appointed Medical Health Officer on the 24th of March, I cannot report on the sanitary condition of the city for the whole year, except on matters of a statistical character, which makes the birth rate 20.46 per 1,000 and the death rate 18.73 per 1,000 in a population of 11,436.

In looking over Mr. Lusted's register of deaths, I find that "Heart Diseases" doubles any other one cause. Now, I do not think that heart diseases are on the increase, but this "cause" is being made the *dumping ground* for fatal cases of other diseases and surgical cases. In Scotland they used to say when a man died it was "for want of breath," and the one is just as good as the other for statistical purposes. A man or woman dying two or three days after an extensive operation, and the cause of death is said to be "heart failure," does not convey the truth in most cases, but renders statistics an unreliable guide.

From November 15, 1898, to November 15, 1899, there were reported 234 births and 152 deaths; 6 cases of smallpox, no deaths; 17 cases of diphtheria, no deaths; 48 cases of scarlet fever, no deaths.

Physicians are required to report cases of typhoid fever, but do not do so. The deaths from this disease is the lowest ever known in this city, being only two in number. From the time that this place was incorporated as a village, I do not believe there has been anything to equal the above record, and it is directly traceable to improved sanitary conditions. The improved water supply, with the intake pipe reaching out beyond shore contamination, is responsible for the reduction of deaths from water borne diseases.

Four deaths from diarrhœa, one from dysentery, four from cholera morbus, and two from typhoid fever, making a total of eleven cases of this class, goes far to show an improvement in the hitherto very unsatisfactory water supply; and, as the cost has not been great, the taxpayer should feel grateful to the commissioners who have executed the work.

House drainage and plumbing have also been greatly improved and only permitted under close inspection.

The city milk supply is not receiving the attention it should have. Looking after the butter fat it contains is not filling the bill. Tuberculous cows must be looked after, and the Veterinary Surgeon must be called in to the aid of the Board of Health, and all animals subjected to the tuberculin test, if we are to protect the public against drinking the milk of consumptive cows.

Scarlet Fever has been the most difficult disease to control this year. Being of a mild form, it insidiously crept about from concealed cases ; but in no instance, so far as I know, was it communicated from a case reported to the Board.

Smallpox in a most remarkable form made its appearance in the month of May. It was simply impossible to differentiate between it and chicken-pox in its early stages ; but after consultation with Dr. Hoare, M.H.O. of Walkerville and Sandwich East, we agreed that the proper thing to do was to drop the scientific question as to what disease it was, and protect the public by placing all persons affected with it within the three municipalities in the isolation hospital. We disinfected every house where the disease was ever suspected and vaccinated all persons in the various neighborhoods. This was done at a time when the Christian Endeavor Society was being quartered in Windsor. Our efforts were completely successful in stamping out the disease, the community was saved from the terror which otherwise would have seized upon it, and commerce was not disturbed as it generally is when newspapers herald under scare headlines the presence of smallpox. Four cases from Windsor, one from Walkerville and fifteen from Sandwich East were cared for at the hospital, and Windsor's share of their maintenance, including medical attendance, was \$78.35.

The Provincial Board of Health, realizing that smallpox was spreading in Essex, requested the different municipalities to issue vaccination proclamations, but owing to an oversight in the resolution, Windsor's proclamation was delayed.

Although there is perhaps no school population in the Dominion better vaccinated, yet there are hundreds of unvaccinated children under 5 years of age and many adults unprotected from smallpox ; and if the city is to be protected against an invasion, these children and those adults vaccinated in childhood should apply at once to their family physician or to the public vaccinators.

It is a subject of congratulation to the Board of Health and the Health Officers that your honorable body has established permanently the Isolation Hospital by purchasing the property on which the building is situated. More comfortable quarters can now be provided, and, instead of dreading it, the public will be glad to avail themselves of the benefits of isolation.

Mr. Grieve, the Inspector, has been most indefatigable in his efforts to abate nuisances, inspect house drains and plumbing, and in ministering to the comforts of the patients in the hospital.

In conclusion, I thank the members of the Board of Health for their cordial assistance in dealing with all matters brought under their notice.

Very respectfully,

JNO. COVENTRY,

Medical Health Officer.

Contagious Diseases.

Some physicians report every case of contagious diseases, while others, I understand, having reported one case in a family, deem it unnecessary to inform this office of subsequent cases in the same family occurring while the placard is still upon the residence and the clearance preparatory to the disinfection has not been issued. It may therefore be found that the figures following do not represent the precise number of cases that have occurred within the year. Forty-eight cases of scarlet fever have been reported, seventeen of diphtheria, and one of small pox. It may be interesting to know at what

period of the year these diseases most largely prevailed, and therefore I have arranged them by months, as follows :

	Diphtheria.	Scarlet Fever.	Small Pox.
Occurring in January.....	3	1	..
“ “ February.....	..	4	..
“ “ March.....	..	14	1
“ “ April .....	..	9	..
“ “ May	1	1	..
“ “ June.....	..	4	..
“ “ July	1	1	..
“ “ August.....	..	3	..
“ “ September.....	1	5	..
“ “ October.....	4	1	..
“ “ November.....	5	3	..
“ “ December.....	2	2	..
Total.....	17	48	1

Doubtless to circumvent the caterers to sensational newspapers, the five cases of small pox that occurred in July and August were not reported to this office, but the patients were taken direct to the hospital and released therefrom privately, so that few citizens and no outsiders were aware of the circumstances, and no alarm was created at home or abroad. While the public health was amply safeguarded, the business interests of the city were not permitted to be jeopardized, as otherwise might have happened. The Medical Health Officer will, in his annual report, furnish all detail in respect to these small pox cases that can be desired.

Sanitary Work. In February last a contract was entered into with J. E. Hillman for gathering and carting to the dumping ground the winter's accumulation of rubbish and garbage from private premises and public alleys, and further to keep the alleys clean up to the first of November; and the work was done in a very satisfactory manner at a cost of \$305.00. The almost universal use of natural gas as fuel contributes largely to the expense of this work, as all waste paper and other materials alike in business places and private houses, that formerly were consumed in stoves, are now necessarily deposited in receptacles or thrown into yards and alleys, to be hauled away at public expense.

A good deal of improvement has this year been made in the city by the erection of some extensive business structures and many dwellings of a superior class, in all which cases modern ideas as to plumbing and drainage have been given full scope. Progress has also been marked in respect to the betterment of old buildings in the same direction, no less than seventy new sewer connections having been made therefrom under the supervision of the Sanitary Inspector.

Under the health by-law no privy vault is allowed after January 1st next upon premises having a legal right to drainage in a public sewer; and in anticipation of that regulation being enforced, hopper closets have this year been substituted for vaults to the number of sixty-seven, and the promise is that the ensuing season will witness a general movement in that direction. The number of vaults cleaned up to date is four hundred and seventy-five.

The expenditure of the board for all purposes up to the first instant has reached \$1,799.68, exceeding the estimates by \$299.68. But a very material part of the disbursements, probably not less than \$390.00, was unforeseen and necessitated by the appearance of small pox in the city. However the apparent deficit is nearly covered by a bill against Sandwich East which will shortly be paid to the city treasurer amounting to \$274.02, and another against Walkerville for \$13.86, being the proportion of hospital expenses those municipalities agreed to pay in consideration of the admission of their small pox patients.

Owing to the prevalence of small pox in the townships of Tilbury, Rochester and Maidstone, and the seeming laxity on the part of the authorities there in the matter of vaccination and isolation, in the earlier days of the outbreak, coupled with the constant communication going on between the people of those municipalities and this city, the Windsor council instructed the mayor to proclaim section 15 of the "Act respecting Vaccination and Inoculation" in force, and appointed four physicians to vaccinate all residents requiring that operation. The outcome of this precautionary measure should be the thorough protection of our citizens; and the Provincial Health Officers having assumed control of the disease in the townships named, affords the further guarantee that the dreaded disease will not now be permitted to come our way from that quarter.

Milk Supply. The number of licenses issued this year to milk vendors is 34, and the number of cows furnishing the supply, so far as can be ascertained, is 469, one vendor alone selling the product of 150 cows which are owned by different farmers in the townships of Sandwich East, South and West. The inspector has examined 25 byres containing 225 cows, and found the premises generally in good condition and the animals well fed and watered. A decided improvement over former inspections was observed in nearly every case.

No test in the quality of the milk sold has been made so far.

Sanitary Condition. Notwithstanding the comparatively large number of cases of contagious diseases that have been reported, the sanitary condition of the city is undoubtedly good.

It is undeniable that the spread of scarlet fever was caused by concealment, through ignorance or by design, of one or two cases in the early part of the year, and patients allowed to mingle with other children in the public schools. Parents guilty of such conduct should be made to feel the full weight of the law. The trouble, worry and expense this inflicted upon the public at large, can hardly be estimated.

With the prospect of an early substitution of Macadam pavements for the worn-out and dangerous cedar pavements, the outlook for the city's health is much brighter than hitherto; and this board, by every means within its power, should encourage and strengthen the hands of those public men who have lent their energies towards providing the city with healthful thoroughfares to supplement our ample and efficient system of sewers.

All of which is respectfully submitted.

STEPHEN LUSTED,

Secretary.

Summary of Annual Reports to the Provincial

ABBREVIATIONS: Sp., *Smallpox*; S., *Scarlatina*;

	ALGOMA.		BRANT.		BRUCE.	
	General in- spection. 2	On com- plaint. 12	General in- spection. 5	On com- plaint. 1	General in- spection. 13	On com- plaint. 11
Is there general sanitary inspection? or is action taken only when complaint of nuisance is made to Board?						
Contagious diseases	Cases. Sp 2 S 2 Dip 27 Ty 27 Tubis .. 3 Yes 10 Hospital. 1	Deaths. Sp 2 S 2 Dip 2 Ty 3 Tubis .. 3 No 4	Cases. Sp 159 S 77 Dip 175 Ty 40 Tubis .. 5 Yes 5 Hospital. 1	Deaths. Sp 5 S 7 Dip 14 Ty 40 No 1	Cases. Sp 72 S 61 Dip 44 Ty 36 Tubis .. 18 Yes 1 Hospital. ..	Deaths. Sp 4 S 12 Dip 6 Ty 36 Tubis .. 2
Is isolation of contagious diseases systematically carried out? Is there any isolation hospital?	Yes 2	No 6	Yes 2	No 1	Yes 11	No 3
Is diphtheria anti-toxine in common use by physicians?	Yes 11	No 4	Yes 5	No	Yes 18	No 3
Is disinfection after contagious diseases carried out under personal supervision of an officer of Board?	(a) Yes.. 3 (b) Yes.. ..	(a) No .. 12 (b) No .. 5	(a) Yes.. 3 (b) Yes.. 1	(a) No .. 4 (b) No .. 3	(a) Yes . 8 (b) Yes	(a) No .. 13 (b) No .. 17
(a) Does Board make systematic inspection of public schools? (b) Does it require a certificate of vaccination from new school children each year?	Yes 4	No 9	Yes 4	No 2	Yes 14	No 5
Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Wells ... 17	Water-works. 1 (a) Yes.. .. No 19 (b) Yes.. .. No 13	Wells.... 6	Water-works.. 1 (a) Yes.. 3 (a) No .. 3 (b) Yes.. 1 (b) No .. 2	Wells.... 20	Water-works.. 1 (a) Yes.. 3 (a) No... 15 (b) Yes.. 1 (b) No
Give source of water supply used on premises.	(a) Yes.. .. No 19 (b) Yes.. .. No 13		(a) Yes.. 3 (a) No .. 3 (b) Yes.. 1 (b) No .. 2		(a) Yes.. 3 (a) No... 15 (b) Yes.. 1 (b) No	
(a) Is there systematic inspection of dairy cows made during the year? (b) Have cases of tuberculosis been found on inspection?	Slaughter-houses. 7	Licensed. .. Inspected 1	Slaughter-houses. 4	Licensed. .. Inspected 1	Slaughter-houses. 8	Licensed. 3 Inspected 5
How many slaughter-houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? Is there systematic inspection by any officer of the Board?	Yes 2	No 10	Yes 2	No 3	Yes 5	No 10
Is there systematic removal of garbage and night soil?	Yes 2	No 16	Yes 2	No 3	Yes 2	No 17
Is there a public sewerage system?	Number with. 1	Number without. 17	Number with. ..	Number without. 5	Number with. 2	Number without. 22
Number of municipalities having noxious trades. (See Sec. 63, Public Health Act)	None.....	.....	None .. ..	.....	1 .....	.....
Have there been prosecutions during year under Public Health Act?	18 .....	.....	5 .....	.....	24 .....	.....
Number of municipalities reporting?						

Board of Health of Municipalities by Counties.

Dip., Diphtheria ; Ty., Typhoid ; Tubis., Tuberculosis.

CARLETON.		DUFFERIN.		ELGIN.		ESSEX.	
General in- spection. 2	On com- plaint. 6	General in- spection. 2	On com- plaint. 3	General in- spection. 4	On com- plaint. 1	General in- spection. 6	On com- plaint. 8
Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Sp 176	Sp 5	Sp 23	Sp 8	Sp 80	Sp 1	Sp 138	Sp 2
S 105	S 31	S 8	S 23	S 20	S 4	S 25	S 2
Dip 233	Dip 37	Dip 21	Dip 1	Dip 6	Dip 4	Dip 95	Dip 18
Ty 135	Ty 135	Ty 7	Ty 6	Ty 32	Ty 32	Ty 31	Ty 3
Tubis 9	Tubis 135	Tubis 6	Tubis 6	Tubis 3	Tubis 4	Tubis 43	Tubis 29
Yes 9	No 2	Yes 6	No 1	Yes 3	No 1	Yes 11	No 1
Hospital, 2		Hospital, ..		Hospital, 1		Hospital, 2	
Yes 6	No 1	Yes 4	No 1	Yes 2	No 1	Yes ... 10	No
Yes 9	No 2	Yes 5	No 2	Yes 1	No 1	Yes 10	No 1
(a) Yes... ..	(a) No... 10	(a) Yes.. 1	(a) No... 6	(a) Yes.. 2	(a) No... 2	(a) Yes. 7	(a) No .. 6
(b) Yes... ..	(b) No... 9	(b) Yes.. ..	(b) No... 5	(b) Yes.. 1	(b) No... 3	(b) Yes.. 3	(b) No... 6
Yes 3	No 5	Yes 4	No 3	Yes 1	No 3	Yes 10	No 3
Wells ... 10	Water- works. 1	Wells.... 6	Water- works. 2	Wells ... 4	Water- works.. 1	Wells ... 10	Water... 4
(a) Yes.. 1	(a) No... 8	(a) Yes.. ..	(a) No... 7	(a) Yes.. 1	(a) No... 3	(a) Yes.. 2	(a) No... 7
(b) Yes . 1	(b) No... 3	(b) Yes.. ..	(b) No... ..	(b) Yes.. ..	(b) No... 3	(b) Yes.. 2	(b) No... 6
Slaughter- houses. 9	Licensed. Inspected 1	Slaughter- houses. 26	Licensed. ... Inspected...	Slaughter- houses. 2	Licensed. ... Inspected...	Slaughter- houses. 21	Licensed. ... Inspected...
Yes 4	No 6	Yes 1	No 5	Yes 2	No 2	Yes 3	No... . 8
Yes 2	No 8	Yes	No 7	Yes 2	No 2	Yes 1	No 12
Number with. 4	Number without. 7	Number with. 1	Number without. 6	Number with. 1	Number without. 3	Number with. 5	Number without. 10
13.....		None.....		28.....		1.....	
11.....		7.....		4.....		15.....	

Summary of Annual Reports to the Provincial

ABBREVIATIONS : Sp., Smallpox ; S. Scarlatina ;

	FRONTENAC.		Grey.		Haldimand.	
	General inspection	On complaint. 3	General inspection. 3	On complaint. 11	General inspection. 5	On complaint. 8
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Is there general sanitary inspection ? or is action taken only when complaint of nuisance is made to Board ?						
Contagious diseases	Sp 356 S 34 Dip 22 Ty 46 Tubis ... 5 Hospital. 3	Sp 15 S 5 Dip 6 Ty 46 Tubis ... 3 Hospital. 3	Sp 9 S 14 Dip 1 Ty 16 Tubis ... 10 Hospital. 1	Sp 2 S 10 Dip 2 Ty 14 Tubis ... 2 Hospital. 1	Sp 3 S 28 Dip 29 Ty 9 Tubis ... 6 Hospital. .	Sp S 3 Dip 2 Ty 2 Tubis ... 9 Hospital. .
Is isolation of contagious diseases systematically carried out ? Is there any isolation hospital ?	Yes 7	No 2	Yes 6	No 4	Yes 7	No
Is diphtheria anti-toxine in common use by physicians ?	Yes 5	No 5	Yes 10	No 1	Yes 4	No 2
Is disinfection after contagious diseases carried out under personal supervision of an officer of Board ?	(a) Yes.. 3 (b) Yes.. .	(a) No .. 7 (b) No .. 3	(a) Yes.. 3 (b) Yes.. .	(a) No .. 9 (b) No .. 4	(a) Yes.. 3 (b) Yes.. .	(a) No .. 6 (b) No .. 6
(a) Does Board make systematic inspection of public schools ? (b) Does it require a certificate of vaccination from new school children each year ?	Yes 3	No 7	Yes 9	No 5	Yes 2	No 4
Are forms for notification by teachers and M. H. O. of contagious diseases supplied ?	Wells ... 7	Water-works.. 1	Wells... 11	Water-works.. 1	Wells ... 7	Water-works.. 1
Give source of water supply used on premises.	(a) Yes.. 2 (b) Yes.. 1	(a) No .. 7 (b) No .. 4	(a) Yes.. 1 (b) Yes.. .	(a) No .. 5 (b) No .. .	(a) Yes.. 1 (b) Yes.. .	(a) No .. 6 (b) No .. 7
(a) Is there systematic inspection of dairy cows made during the year ? (b) Have cases of tuberculosis been found on inspection ?	Slaughter-houses. 17	Licensed .. Inspected ..	Slaughter-houses. 18	Licensed. . Inspected 4	Slaughter-houses. 9	Licensed. Inspected 2
How many slaughter-houses in municipality ? Are they licensed on evidence of being kept in good sanitary condition ? Is there systematic inspection by any officer of the Board ?	Yes 2	No 10	Yes 1	No. 10	Yes 1	No 6
Is there systematic removal of garbage and night soil ?	Yes 1	No 8	Yes 1	No 13	Yes 1	No 6
Is there a public sewerage system ?	Number with... 2	Number without 9	Number with... 3	Number without. 11	Number with. .	Number without. 8
Number of municipalities having noxious trades. (See sec. 63, Public Health Act).	One		Two		None	
Have there been prosecutions during year under Public Health Act ?	11		14		8	
Number of municipalities reporting ?						

Board of Health of Municipalities by Counties.

Dip., *Diphtheria*; Ty., *Typhoid*; Tubis., *Tuberculosis*.

Hastings.		Halton.		Haliburton.		Huron.	
General inspection. 5	On complaint. 9	General inspection. 2	On complaint. 3	General inspection. 1	On complaint. 2	General inspection. 6	On complaint. 11
Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Sp. 191	Sp. 7	Sp. 1	Sp. 1	Sp. 1	Sp. 1	Sp. 42	Sp. 2
S. 12	S. 1	S. 1	S. 1	S. 1	S. 1	S. 9	S. 1
Dip. 17	Dip. 1	Dip. 7	Dip. 1	Dip. 4	Dip. 1	Dip. 39	Dip. 1
Ty. 12	Ty. 11	Ty. 3	Ty. 1	Ty. 2	Ty. 1	Ty. 38	Ty. 37
Tubis. 8	Tubis. 7	Tubis. 3	Tubis. 1	Tubis. 2	Tubis. 1	Tubis. 10	Tubis. 6
Yes 8	No 7	Yes 3	No 1	Yes 2	No 1	Yes 10	No 6
Hospital. 1		Hospital. ..		Hospital. ..		Hospital. ..	
Yes 7	No 1	Yes 2	No 1	Yes 2	No 1	Yes 6	No 4
Yes 7	No 6	Yes 1	No 1	Yes 2	No 1	Yes 11	No 5
(a) Yes.. 4	(a) No.. 9	(a) Yes.. 1	(a) No.. 1	(a) Yes.. 1	(a) No.. 3	(a) Yes.. 7	(a) No.. 10
(b) Yes.. 1	(b) No.. 7	(b) Yes.. ..	(b) No.. 1	(b) Yes.. ..	(b) No.. 3	(b) Yes.. 4	(b) No.. 10
Yes 1	No 6	Yes	No 2	Yes	No 3	Yes 5	No 12
Wells. .. 10	Water works. 1	Wells ... 4	Water-works. .. 2	Wells ... 4	Water-works. .. 2	Wells ... 15	Water-works.. .. 12
(a) Yes.. 1	(a) No.. 13	(a) Yes.. 1	(a) No.. 2	(a) Yes.. ..	(a) No.. 2	(a) Yes.. 2	(a) No.. 12
(b) Yes.. 1	(b) No.. 7	(b) Yes.. ..	(b) No.. 2	(b) Yes.. ..	(b) No.. 2	(b) Yes.. ..	(b) No.. ..
Slaughter-houses. 29	Licensed Inspected 2	Slaughter-houses. 25	Licensed. .. Inspected ..	Slaughter-houses. 1	Licensed. .. Inspected ..	Slaughter-houses. 20	Licensed. 2 Inspected 2
Yes 2	No 11	Yes	No 3	Yes	No 2	Yes 1	No 13
Yes 2	No 13	Yes	No 4	Yes	No 3	Yes 2	No 13
Number with. 7	Number without. 8	Number with. 2	Number without. 2	Number with. ..	Number without. 4	Number with. ..	Number without. 20
None		None		None		Two	
15		4		4		20	

Summary of Annual Reports to the Provincial

ABBREVIATIONS: Sp., *Smallpox*; S., *Scarlatina*;

	KENT.		LAMBTON.		LANARK.	
	General inspection.	On complaint. ..	General inspection. ...	On complaint. ...	General inspection. 2	On complaint. 9
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Is there general sanitary inspection? or is action taken only when complaint of nuisance is made to Board?	Sp. 2	Sp. 2	Sp. 2	Sp. 4	Sp. 18	Sp. 12
Contagious diseases.	S. 23	S. 2	S. 54	S. 4	S. 12	S. 3
	Dip. 24	Dip. 3	Dip. 93	Dip. 2	Dip. 10	Dip. 7
	Ty. 25	Ty. 7	Ty. 42	Ty. 5	Ty. 7	Ty. 1
	Tubis. 23	Tubis. 23	Tubis. 25	Tubis. 19	Tubis. 7	Tubis. 1
Is isolation of contagious diseases systematically carried out? Is there any isolation hospital?	Yes. 7	No. 2	Yes. 11	No. 1	Yes. 7	No. 1
Is diphtheria anti-toxine in common use by physicians?	Hospital.		Hospital.		Hospital.	
Is disinfection after Contagious diseases carried out under the personal supervision of an officer of the Board?	Yes. 7	No.	Yes. 8	No.	Yes. 4	No.
(a) Does the Board make systematic inspection of the public schools?	Yes. 4	No. 6	Yes. 9	No. 1	Yes. 4	No. 4
(b) Does it require a certificate of vaccination from new school children each year?	(a) Yes. 4	(a) No. 6	(a) Yes. 5	(a) No. 9	(a) Yes. 1	(a) No. 8
Are forms for Notification by Teachers and M. H. O. of Contagious Diseases supplied?	(b) Yes. 1	(b) No. 8	(b) No. 1	(b) No. 9	(b) Yes. 1	(b) No. 8
Give source of Water supply used on premises.	Yes. 3	No. 4	Yes. 6	No. 4	Yes. 3	No. 6
(a) Is there systematic inspection of Dairy Cows made during the year? (b) Have cases of tuberculosis been found on inspection?	Wells 9	Water-works. 1	Wells 11	Water-works. 2	Wells 8	Water-works.
How many slaughter-houses in Municipality? Are they licensed on evidence of being kept in good sanitary condition? Is there systematic inspection by any officer of the Board?	(a) Yes. (a) No. 8	(a) Yes. 2	(a) No. 10	(a) Yes. 1	(a) No. 8	(a) Yes. 1
Is there systematic removal of Garbage and Night Soil?	(b) Yes. (b) No. 7	(b) Yes.	(b) No. 10	(b) Yes. 1	(b) No. 8	(b) Yes. 1
Is there a public sewerage system?	Slaughter-houses. 14	Licensed. 1	Slaughter-houses. 28	Licensed. 1	Slaughter-houses. 5	Licensed. ...
Number of Municipalities having Noxious Trades. (See Sec. 63, Public Health Act).	Inspected. 1		Inspected. ...		Inspected. ...	
Have there been prosecutions during year under Public Health Act?	Yes. 3	No. 6	Yes. 5	No. 6	Yes. 1	No. 9
Number of Municipalities reporting.	Yes.	No. 9	Yes. 3	No. 10	Yes.	No. 8
	Number with.	Number without. 9	Number with. 1	Number without. 13	Number with. 2	Number without. 8
	None.		None.		None.	
	9.		14.		10.	

Board of Health of Municipalities by Counties.

Dip., Diphtheria; Ty., Typhoid; Tubis., Tuberculosis.

LEEDS AND GRENVILLE.		LENNOX AND ADDINGTON.		LINCOLN.		MIDDLESEX.	
General in- spection 4	On com- plaint. 12	General in- spection. 4	On com- plaint. 5	General in- spection. 3	On com- plaint. 8	General in- spection. 5	On com- plaint. 10
Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Sp 5	Sp 2	Sp 5	Sp 4	Sp 163	Sp 3	Sp 2	Sp 13
S 51	S 6	S 9	S 4	S 37	S 3	S 238	S 18
Dip 55	Dip 1	Dip 7	Dip 1	Dip 37	Dip 3	Dip 113	Dip 7
Ty 11	Ty 1	Ty 4	Ty 13	Ty 13	Ty 3	Ty 87	Ty 78
Tubis 51	Tubis 45	Tubis 15	Tubis 13	Tubis 32	Tubis 30	Tubis 80	Tubis 2
Yes 7	No 7	Yes 8	No 6	Yes 7		Yes 9	No 2
Hospital .. 1		Hospital ...		Hospital .. 1		Hospital .. 1	
Yes 6	No 2	Yes 5	No 1	Yes 5	No 1	Yes 10	No 1
Yes 7	No 5	Yes 5	No 1	Yes 6	No 2	Yes 8	No 4
(a) Yes 2	(a) No 10	(a) Yes 1	(a) No 8	(a) Yes 3	(a) No 6	(a) Yes 4	(a) No 9
(b) Yes 1	(b) No 12	(b) Yes 1	(b) No 7	(b) Yes 1	(b) No 7	(b) Yes 1	(b) No 10
Yes 3	No 8	Yes 1	No 5	Yes 4	No 4	Yes 6	No 3
Wells 10	Water- works... 2	Wells 5	Water works... 7	Wells 6	Water- works... 3	Wells 7	Water- work... 1
(a) Yes 1	(a) No 10	(a) Yes 1	(a) No 7	(a) Yes 1	(a) No 8	(a) Yes 1	(a) No 16
(b) Yes 1	(b) No 7	(b) Yes 1	(b) No 6	(b) Yes 1	(b) No 8	(b) Yes 1	(b) No 16
Slaughter- houses. 11	Licensed ... Inspected ..	Slaughter houses. 8	Licensed .. Inspected ..	Slaughter- houses. 19	Licensed ..1 Inspected ..	Slaughter- houses. 12	Licensed ..2 Inspected ..
Yes 1	No 7	Yes 2	No 5	Yes 2	No 6	Yes 2	No 15
Yes 1	No 10	Yes 1	No 7	Yes 1	No 8	Yes 1	No 8
Number with..... 3	Number without. 11	Number with..... 9	Number without... 9	Number with..... 9	Number without. 9	Number with..... 16	Number without. 16
None		One		None		Four	
14		9		9		16	

Summary of Annual Reports to the Province

ABBREVIATIONS : Sp., *Smallpox* ; S., *Scarlatina* ;

	MUSKOKA.		NORFOLK.		NORTHUMBERLAND AND DURHAM.	
	General inspection. 6	On complaint. 14	General inspection. 4	On complaint. 5	General inspection. 9	On complaint. 11
Is there general sanitary inspection ? or is action taken only when complaint of nuisance is made to Board ?						
Contagious diseases	Cases. Sp 1 S 47 Dip 6 Ty 24 Tubis .. 46 Yes 12 Hospital. ..	Deaths. Sp 1 S 6 Dip 2 Ty 4 Tubis .. 7 No 3	Cases. Sp S 9 Dip 1 Ty 10 Tubis .. 10 Yes 5 Hospital. ..	Deaths. Sp S Dip Ty 3 Tubis .. 10 No 2	Cases. Sp 196 S Dip 54 Ty 110 Tubis .. 33 Yes 17 Hospital. ..	Deaths. Sp S 4 Dip 11 Ty 11 Tubis .. 29 No 2
Is isolation of contagious diseases systematically carried out ? Is there any isolation hospital ?	Yes 2	No 4	Yes 5	No 1	Yes 10	No 4
Is diphtheria anti-toxine in common use by physicians ?	Yes 15	No 2	Yes 3	No 4	Yes 10	No 4
Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board ?	(a) Yes.. 7 (b) Yes.. ..	(a) No... 11 (b) No... 18	(a) Yes.. .. (b) Yes.. ..	(a) No... 7 (b) No... 8	(a) Yes.. 4 (b) Yes.. 1	(a) No... 14 (b) No... 16
(a) Does the Board make systematic inspection of the public schools ? (b) Does it require a certificate of vaccination from new school children each year ?	Yes 6	No 7	Yes ... 3	No 5	Yes 5	No 9
Are forms for notification by teachers and M. H. O. of contagious diseases supplied ?	Wells ... 17	Water-works.. 1	Wells ... 8	Water-works.. ..	Wells ... 16	Water-works.. 2
Give source of water supply used on premises.	(a) Yes.. 1 (b) Yes.. ..	(a) No... 16 (b) No... 16	(a) Yes.. 1 (b) Yes.. 1	(a) No... 8 (b) No... 8	(a) Yes.. 2 (b) Yes.. ..	(a) No... 16 (b) No... 16
(a) Is there systematic inspection of dairy cows made during the year ? (b) Have cases of tuberculosis been found on inspection ?	Slaughter-houses. 12	Licensed. 2 Inspected 1	Slaughter-houses. 16	Licensed .. Inspected ..	Slaughter-houses. 31	Licensed 4 Inspected 3
How many slaughter-houses in municipality ? Are they licensed on evidence of being kept in good sanitary condition ? Is there systematic inspection by any officer of the Board ?	Yes 2	No 15	Yes 1	No 8	Yes 2	No 13
Is there systematic removal of garbage and night soil ?	Yes	No 18	Yes	No 9	Yes 2	No 16
Is there a public sewerage system ?	Number with.. 1	Number without. 17	Number with.	Number without. 9	Number with.	Number without. 18
Number of municipalities having noxious trades. (See Sec. 63, Public Health Act).	Four		None		None	
Have there been prosecutions during year under Public Health Act ?	18..		9		18..	
Number of municipalities reporting ?						

Board of Health of Municipalities by Counties.

Dip., Diphtheria ; Ty., Typhoid ; Tubis., Tuberculosis.

ONTARIO.				OXFORD.				PEEL.				PERTH.			
General inspection.		On complaint. ..		General inspection. 9		On complaint. 4		General inspection. 3		On complaint. 3		General inspection.		On complaint. ..	
Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Sp 171	Sp 5	Sp 30	Sp 1	Sp 27	Sp 5	Sp 35	Sp 1	Sp 27	Sp 5	Sp 35	Sp 1	Sp 35	Sp 1	Sp 35	Sp 1
S 53	S 4	S 21	S 2	S 9	S 2	S 3	S 1	S 9	S 2	S 3	S 1	S 3	S 1	S 3	S 1
Dip 62	Dip 4	Dip 120	Dip 7	Dip 6	Dip 1	Dip 16	Dip 1	Dip 6	Dip 1	Dip 16	Dip 1	Dip 16	Dip 1	Dip 16	Dip 1
Ty 52	Ty 47	Ty 38	Ty 33	Ty 8	Ty 8	Ty 15	Ty 15	Ty 8	Ty 8	Ty 15	Ty 15	Ty 15	Ty 15	Ty 15	Ty 15
Tubis 12	Tubis 2	Tubis 9	Tubis 1	Tubis 4	Tubis 1	Tubis 1	Tubis 1	Tubis 4	Tubis 1	Tubis 1	Tubis 1	Tubis 1	Tubis 1	Tubis 1	Tubis 1
Yes 12	No 2	Yes 9	No 1	Yes 4	No 1	Yes 1	No 1	Yes 4	No 1	Yes 1	No 1	Yes 1	No 1	Yes 1	No 1
Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..	Hospital ..
Yes 6	No 4	Yes 7	No	Yes 3	No 2	Yes 2	No 3	Yes 3	No 2	Yes 2	No 2	Yes 2	No 2	Yes 2	No 2
Yes .. . 10	No. 3	Yes 9	No 2	Yes 2	No	Yes 3	No 3	Yes 2	No	Yes 3	No 3	Yes 3	No 3	Yes 3	No 3
(a) Yes.. 5	(a) No... 8	(a) Yes.. 7	(a) No... 4	(a) Yes.. 4	(a) No... ..	(a) Yes.. 1	(a) No... 6	(a) Yes.. 4	(a) No... ..	(a) Yes.. 1	(a) No... 6	(a) Yes.. 1	(a) No... 6	(a) Yes.. 1	(a) No... 6
(b) Yes.. 1	(b) No... 12	(b) Yes.. 2	(b) No... 11	(b) Yes.. 1	(b) No... 3	(b) Yes.. ..	(b) No... 7	(b) Yes.. 1	(b) No... 3	(b) Yes.. ..	(b) No... 7	(b) Yes.. ..	(b) No... 7	(b) Yes.. ..	(b) No... 7
Yes 9	No 5	Yes 7	No 4	Yes 3	No 1	Yes 3	No 3	Yes 3	No 1	Yes 3	No 3	Yes 3	No 3	Yes 3	No 3
Wells ... 13	Water-works..	Wells.....	Water-works.. 2	Wells ... 4	Water-works.. 1	Wells.... 7	Water-works.. 4	Wells ... 4	Water-works.. 1	Wells.... 7	Water-works.. 4	Wells.... 7	Water-works.. 4	Wells.... 7	Water-works.. 4
(a) Yes.. 3	(a) No... 8	(a) Yes.. 1	(a) No... 8	(a) Yes.. 1	(a) No... 3	(a) Yes.. ..	(a) No... 6	(a) Yes.. 1	(a) No... 3	(a) Yes.. ..	(a) No... 6	(a) Yes.. ..	(a) No... 6	(a) Yes.. ..	(a) No... 6
(b) Yes.. ..	(b) No... 8	(b) Yes.. ..	(b) No... 9	(b) Yes.. ..	(b) No... 3	(b) Yes.. ..	(b) No... 5	(b) Yes.. ..	(b) No... 3	(b) Yes.. ..	(b) No... 5	(b) Yes.. ..	(b) No... 5	(b) Yes.. ..	(b) No... 5
Slaughter-houses. 27	Licensed .. Inspected 3	Slaughter-houses. 31	Licensed 3 Inspected 5	Slaughter-houses. 26	Licensed 2 Inspected ..	Slaughter-houses. 13	Licensed .. Inspected ..	Slaughter-houses. 26	Licensed 2 Inspected ..	Slaughter-houses. 13	Licensed .. Inspected ..	Slaughter-houses. 13	Licensed .. Inspected ..	Slaughter-houses. 13	Licensed .. Inspected ..
Yes 2	No 3	Yes 4	No 5	Yes	No 3	Yes	No 6	Yes	No 3	Yes	No 6	Yes	No 6	Yes	No 6
Yes	No. 13	Yes 1	No 9	Yes	No 4	Yes	No 7	Yes	No 4	Yes	No 7	Yes	No 7	Yes	No 7
Number with. 2	Number without. 13	Number with. ..	Number without. 11	Number with. ..	Number without. 5	Number with. ..	Number without. 7	Number with. ..	Number without. 5	Number with. ..	Number without. 7	Number with. ..	Number without. 7	Number with. ..	Number without. 7
Two	Two	Three	Three	Two	Two	None	None	Two	Two	None	None	Two	Two	None	None
15.	15.	11.	11.	5.	5.	7.	7.	5.	5.	7.	7.	5.	5.	7.	7.

Summary of Annual Reports to the Provincial

ABBREVIATIONS: Sp., *Smallpox*; S., *Scarlatina*

	PRESCOTT & RUSSELL.		PETERBORO.		PRINCE EDWARD.		
	General inspection.	On complaint.	General inspection.	On complaint.	General inspection.	On complaint.	
Is there general sanitary inspection? or is action taken only when complaint of nuisance is made to Board?							
Contagious diseases	Cases. Sp. 20 S. 56 Dip. 31 Ty. 33 Tubis. 30 Yes. 9 Hospital. ..	Deaths. Sp. 4 S. 1 Dip. 4 Ty. 4 Tubis. 30 No. 1	Cases. Sp. 98 S. 5 Dip. 38 Ty. 18 Tubis. 6 Hospital. 1	Deaths. Sp. 2 S. 2 Dip. 2 Ty. 2 Tubis. 3 No. 1	Cases. Sp. 20 S. 19 Dip. 8 Ty. 14 Tubis. 6 Hospital. ..	Deaths. Sp. S. Dip. Ty. Tubis. 13 No. 1	
Is isolation of contagious diseases systematically carried out? Is there any isolation hospital?	Yes. 9	No.	Yes. 4	No. 1	Yes. 5	No. 1	
Is diphtheria anti-toxine in common use by physicians?	Yes. 8	No. 2	Yes. 7	No. 1	Yes. 6	No. 1	
Is disinfection after contagious diseases carried out under personal supervision of an officer of the Board?	(a) Yes. (b) Yes. 3	(a) No. 10 (b) No. 7	(a) Yes. 1 (b) Yes.	(a) No. 7 (b) No. 7	(a) Yes. 1 (b) Yes.	(a) No. 5 (b) No. 7	
(a) Does the Board make systematic inspection of the public schools?							
(b) Does it require a certificate of vaccination from new school children each year?	Yes. 2	No. 8	Yes. 2	No. 6	Yes. 4	No. 2	
Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Wells ... 8	Water works..	Wells ... 8	Water-works.. 1	Wells ... 6	Water-works..	
Give source of water supply used on premises?	(a) Yes. (b) Yes.	(a) No. 10 (b) No. 10	(a) Yes. (b) Yes.	(a) No. 9 (b) No. 7	(a) Yes. (b) Yes.	(a) No. 6 (b) No. 6	
(a) Is there systematic inspection of dairy cows made during the year?							
(b) Have cases of tuberculosis been found on inspection?	Slaughter houses. 25	Licensed. 2 Inspected 1	Slaughter houses. 18	Licensed. 1 Inspected 1	Slaughter houses. 12	Licensed. 1 Inspected ..	
How many slaughter-houses in municipality?	Yes.	No. 10	Yes. 3	No. 4	Yes.	No. 6	
Are they licensed on evidenced of being kept in good sanitary condition? Is there systematic inspection by any officer of the Board?	Yes.	No. 10	Yes. 1	No. 7	Yes.	No.	
Is there systematic removal of garbage and night soil?	Number with.	Number without. 10	Number with.	Number without. 9	Number with.	Number without. 15	
Is there a public sewerage system?	None.	One.	One.	One.	One.	Two.	
Number of municipalities having noxious trades. (See Sec. 63, Public Health Act.)							
Have there been prosecutions during year under Public Health Act?	10.	9.	7.	15.			
Number of municipalities reporting?							

Board of Health of Municipalities by Counties.

Dip., *Diphtheria*; Ty., *Typhoid*; Tubis., *Tuberculosis*.

PARRY SOUND.		RENFREW.		RAINY RIVER.		SIMCOE.	
General in- spection. 4	On com- plaint. 7	General in- spection. 2	com- p. t.	General in- spection. 1	On com- plaint. 2	General in- spection. 7	On com- plaint. 14
Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Sp. 9	Sp. 1	Sp. 20	Sp. 2	Sp. 17	Sp. 1	Sp. 36	Sp. 1
S. 11	Dip. 2	Dip. 51	Dip. 1	Dip. 2	Dip. 7	Dip. 23	Dip. 2
Ty. 9	Ty. 6	Ty. 11	Ty. 2	Ty. 12	Ty. 7	Ty. 12	Ty. 41
Tubis. 12	Tubis. 12	Tubis. 24	Tubis. 20	Tubis. 9	Tubis. 7	Tubis. 50	Tubis. 4
Yes 9	No. 1	Yes 10	No. 1	Yes 2	No. 1	Yes 10	No. 4
Hospital. 1		Hospital. ..		Hospital. ..		Hospital. ..	
Yes 3	No.	Yes 10	No.	Yes 2	No. 1	Yes 8	No. 3
Yes 9	No. 1	Yes 8	No. 3	Yes 2	No. 1	Yes 11	No. 3
(a) Yes.. 2	(a) No .. 11	(a) Yes.. 1	(a) No .. 13	(a) Yes.. 1	(a) No .. 2	(a) Yes.. 6	(a) No .. 12
(b) Yes.. ..	(b) No .. 11	(b) Yes.. ..	(b) No .. 13	(b) Yes.. ..	(b) No .. 3	(b) Yes.. 2	(b) No .. 12
Yes 6	No. 7	Yes 4	No. 7	Yes 1	No.	Yes 9	No. 8
Wells ... 11	Water- works.. 1	Wells ... 10	Water- works.. 2	Wells ... 2	Water- works.. 1	Wells ... 18	Water- works.. 3
(a) Yes.. ..	(a) No .. 12	(a) Yes.. 1	(a) No .. 11	(a) Yes.. 2	(a) No .. 1	(a) Yes.. ..	(a) No
(b) Yes.. ..	(b) No .. 12	(b) Yes.. ..	(b) No .. 11	(b) Yes.. 1	(b) No .. 1	(b) Yes.. ..	(b) No
Slaughter- houses. 8	Licensed. 1 Inspected 1	Slaughter- houses. 5	Licensed. .. Inspected 1	Slaughter- houses. 4	Licensed. .. Inspected 2	Slaughter- houses. 31	Licensed. 1 Inspected 1
Yes 11	No. 9	Yes 2	No. 9	Yes 1	No. 1	Yes 3	No. 16
Yes	No. 12	Yes	No. 12	Yes 2	No. 1	Yes	No. 15
Number with.	Number without. 15	Number with. 2	Number without 12	Number with.	Number without. 3	Number with. 2	Number without. 16
None.. ..		None.. ..		One		None.. ..	
15.. ..		14.. ..		3.. ..		18.. ..	

Summary of Annual Reports to the Provincial

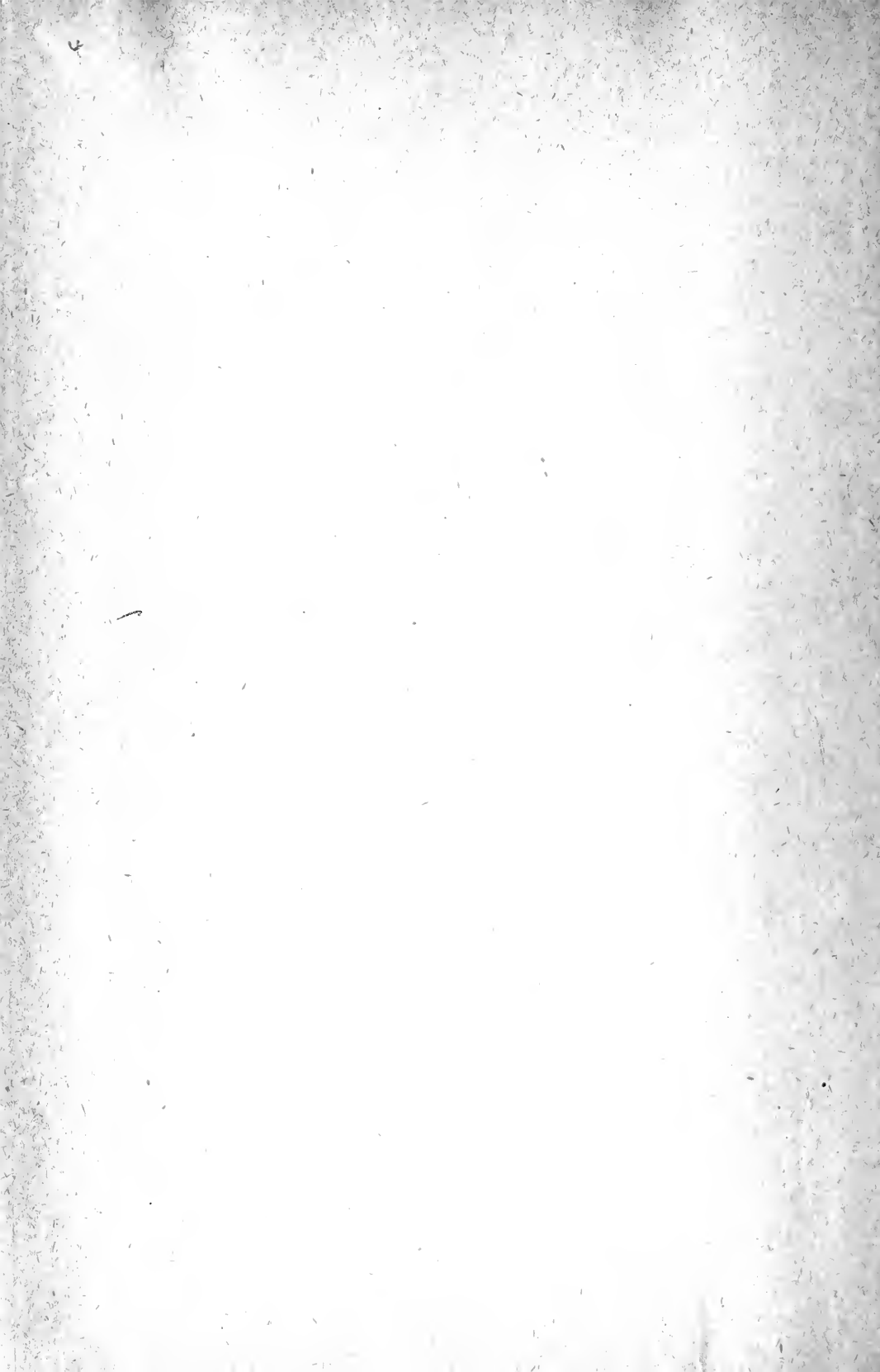
ABBREVIATIONS : Sp., *Smallpox*; S., *Scarlatina* ;

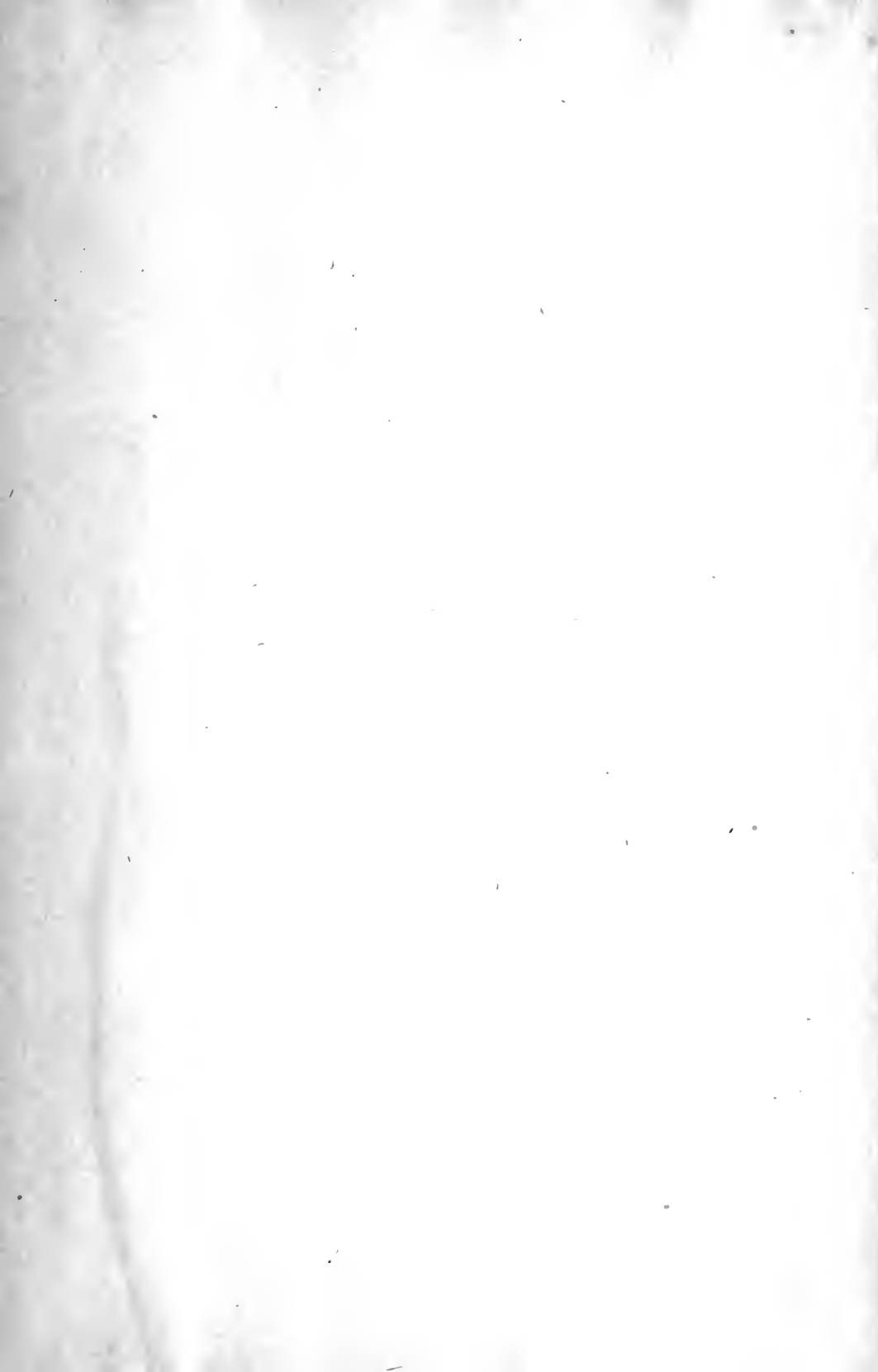
	STORMONT, DUNDAS AND GLENGARRY.		VICTORIA.		WENTWORTH.	
	General inspection.	On complaint. . .	General inspection. 3	On complaint. 7	General inspection. 5	On complaint. 6
Is there general sanitary inspection? or is action taken only when complaint of nuisance is made to Board?						
Contagious diseases.....	Cases. 12 Sp. 21 S. 4 Dip 23 Ty 27 Tubis ... 9 Yes Hospital. . .	Deaths. 3 Sp. 1 S. 1 Dip 1 Ty 1 Tubis ... 27 Yes 2 No Hospital. . .	Cases. 10 Sp. 10 S. 18 Dip 19 Ty 14 Tubis ... 7 Yes 7 No Hospital. . .	Deaths. 1 Sp. 1 S. 1 Dip 3 Ty 13 Tubis ... 1 Yes 1 No Hospital. . .	Cases. 173 Sp. 105 S. 73 Dip 86 Ty 8 Tubis ... 1 Yes 1 No Hospital. . .	Deaths. 7 Sp. 7 S. 14 Dip 15 Ty 74 Tubis Yes No Hospital. . .
Is isolation of contagious diseases systematically carried out? Is there any isolation hospital?	Yes 6	No 2	Yes 7	No 1	Yes 7	No 1
Is diphtheria anti-toxine in common use by physicians?	Yes 10	No 1	Yes 5	No 3	Yes 7	No 2
Is disinfection after contagious diseases carried out under the personal supervision of an officer of the Board?	(a) Yes.. 2 (b) Yes.. 1	(a) No .. 9 (b) No .. 8	(a) Yes.. 2 (b) Yes.. ..	(a) No .. 7 (b) No .. 7	(a) Yes.. 3 (b) Yes.. 2	(a) No .. 7 (b) No .. 9
Are forms for notification by teachers and M. H. O. of contagious diseases supplied?	Yes 4	No 7	Yes 3	No 4	Yes 5	No 4
Give source of water supply used on premises?	Wells ... 10	Water-works.. 2	Wells ... 6	Water-works.. ..	Wells ... 7	Water-works. 2
(a) Is there systematic inspection of dairy cows made during the year?	(a) Yes.. 3 (b) Yes.. 1	(a) No .. 9 (b) No .. 9	(a) Yes.. 1 (b) Yes.. ..	(a) No .. 7 (b) No .. 7	(a) Yes.. 4 (b) Yes.. 1	(a) No .. 6 (b) No .. 6
(b) Have cases of tuberculosis been found on inspection?	Slaughter-houses. 11	Licensed Inspected .. 1	Slaughter-houses. 8	Licensed Inspected .. 1	Slaughter-houses. 28	Licensed Inspected ..
How many slaughter-houses in municipality? Are they licensed on evidence of being kept in good sanitary condition? Is there systematic inspection by any officer of Board?	Yes 2	No 8	Yes 1	No 7	Yes 3	No 5
Is there systematic removal of garbage and night soil?	Yes	No 10	Yes	No 7	Yes 1	No 5
Is there a public sewerage system?	Number with. ..	Number without. 11	Number with. 2	Number without. 6	Number with. 2	Number without. 7
Number of municipalities having noxious trades. (See Sec. 63, Public Health Act).	None	One	Two	Two	Two	Two
Have there been prosecutions during year under Public Health Act?	11	8	9	9	9	9
Number of municipalities reporting?						

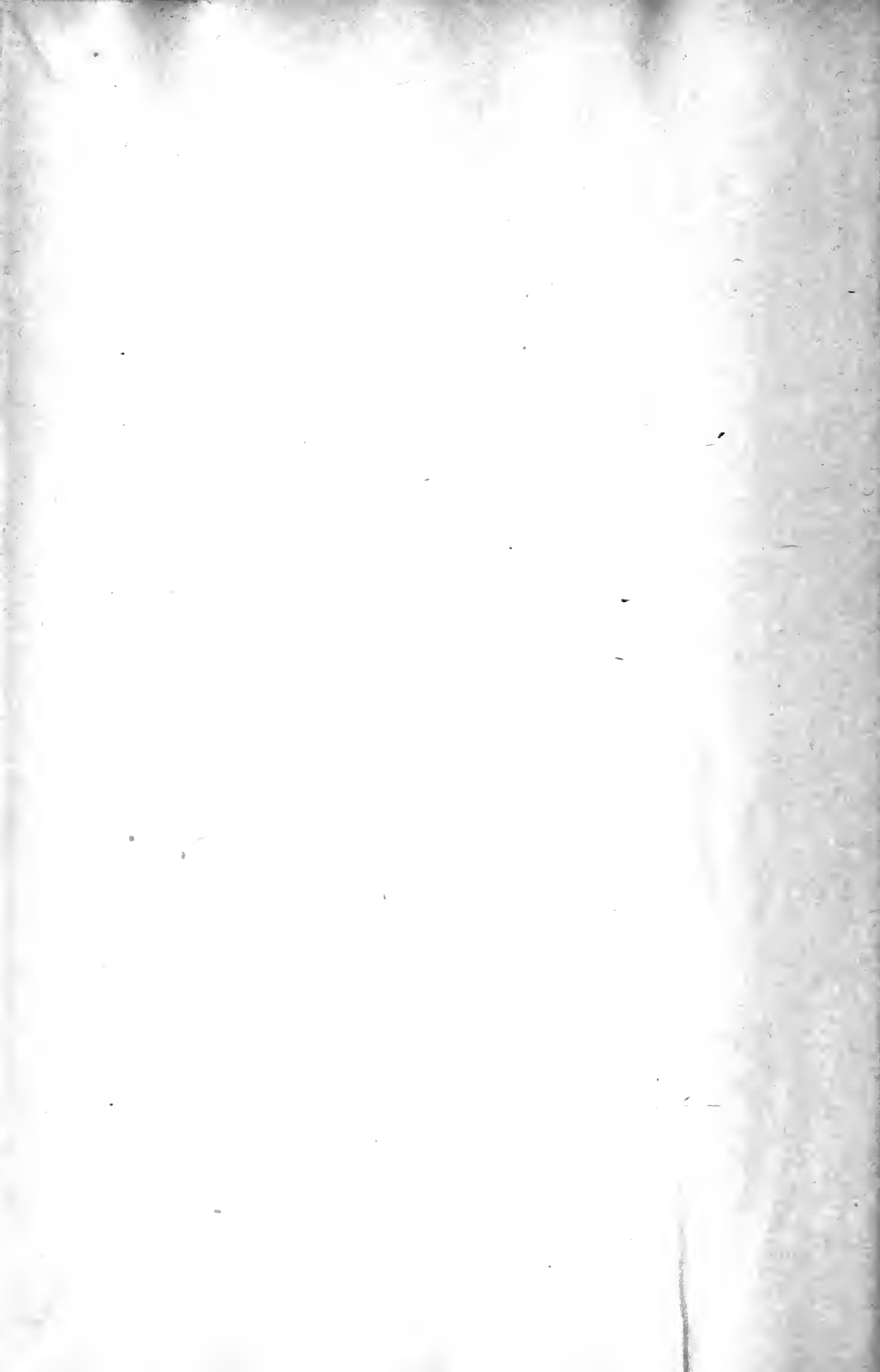
Board of Health of Municipalities by Counties.

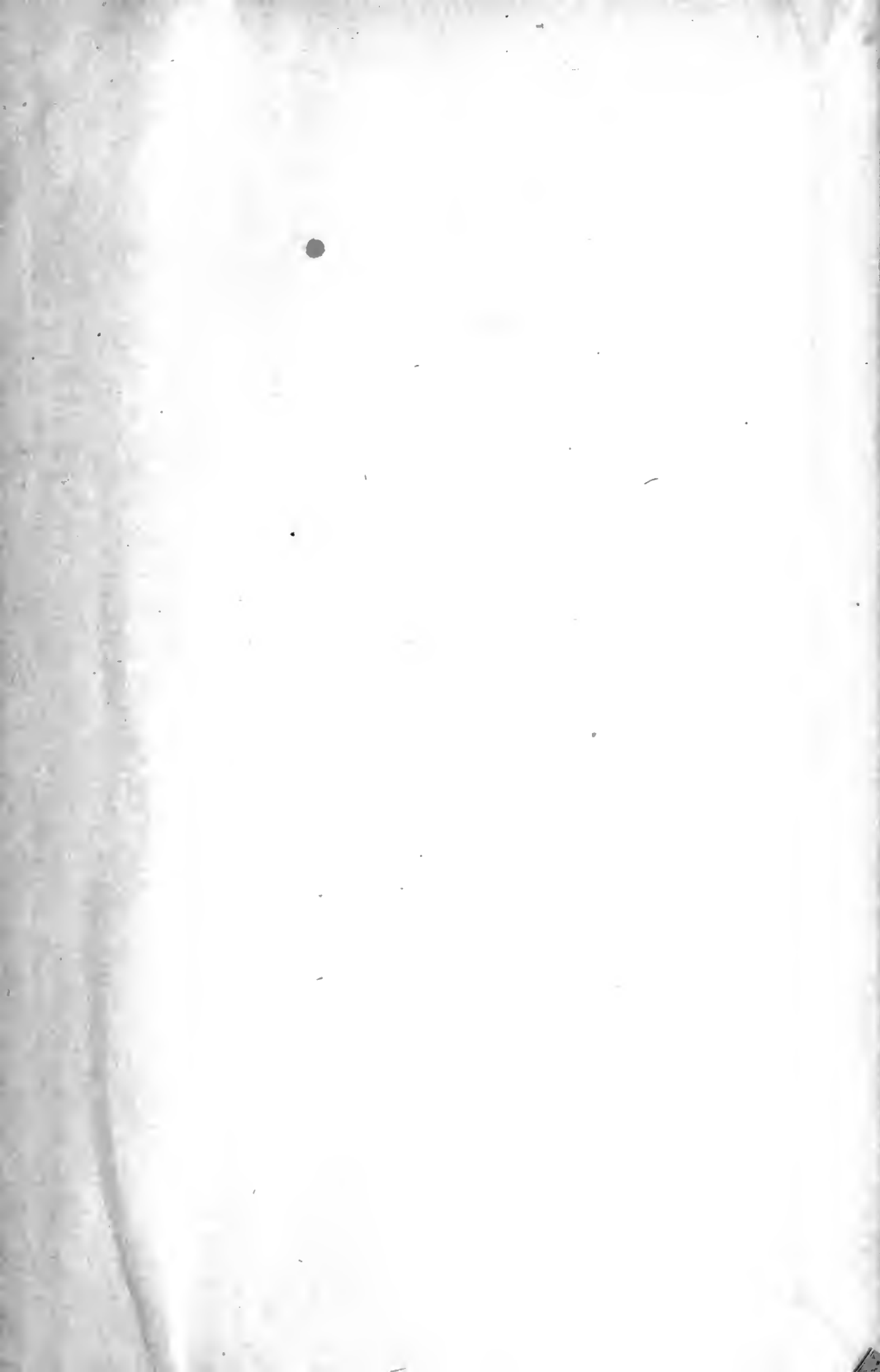
Dip., *Diphtheria* ; Ty., *Typhoid* ; Tubis., *Tuberculosis*.

WATERLOO.		WELLAND.		WELLINGTON.		YORK.	
General in- spection. 5	On com- plaint. 4	General in- spection. 3	On com- plaint. 6	General in- spection. 9	On com- plaint. 7	General in- spection. 9	On com- plaint. 4
Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Sp 237	Sp 10	Sp 59	Sp 1	Sp 35	Sp 2	Sp 1,208	Sp 62
S 28	S 4	S 44	S 5	S 22	S 7	S 490	S 85
Dip 106	Dip 5	Dip 21	Dip 3	Dip 33	Dip 5	Dip 282	Dip 48
Ty 8	Ty 8	Ty 15	Ty 15	Ty 22	Ty 18	Ty 364	Ty 363
Tubis ... 8	Tubis ... 8	Tubis ... 9	Tubis ... 1	Tubis ... 12	Tubis ... 3	Tubis ... 13	Tubis ... 1
Yes 8	No	Yes 9	No 1	Yes 12	No 3	Yes 13	No 1
Hospital. 1		Hospital. 1		Hospital. 1		Hospital. 1	
Yes 7	No	Yes 1	No 4	Yes 9	No 3	Yes 11	No 1
Yes 8	No	Yes 5	No 2	Yes 10	No 6	Yes 9	No 4
(a) Yes.. 5	(a) No .. 2	(a) Yes .. 2	(a) No .. 8	(a) Yes.. 3	(a) No .. 9	(a) Yes.. 5	(a) No .. 10
(b) Yes.. 2	(b) No .. 5	(b) Yes.. 1	(b) No .. 7	(b) Yes.. 2	(b) No .. 10	(b) Yes.. 3	(b) No .. 11
Yes 5	No 2	Yes 2	No 5	Yes 7	No 3	Yes 8	No 3
Wells ... 6	Water-works.. 1	Wells ... 8	Water-works.. 2	Wells ... 16	Water-works.. 2	Wells ... 11	Water-works.. 3
(a) Yes.. 4	(a) No .. 3	(a) Yes.. 2	(a) No .. 5	(a) Yes.. ..	(a) No .. 10	(a) Yes.. 4	(a) No .. 8
(b) Yes.. 1	(b) No .. 3	(b) Yes.. ..	(b) No .. 6	(b) Yes.. ..	(b) No .. 12	(b) Yes.. ..	(b) No .. 9
Slaughter-30	Licensed 1	Slaughter-15	Licensed 1	Slaughter-19	Licensed ..	Slaughter-72	Licensed 3
houses.	Inspected 1	houses.	Inspected 1	houses.	Inspected 3	houses.	Inspected 40
Yes 1	No 5	Yes 2	No 8	Yes 3	No 12	Yes 4	No 10
Yes 1	No 5	Yes 2	No 9	Yes	No 13	Yes 1	No 12
Number with. 2	Number without. 5	Number with. 2	Number without. 9	Number with. ..	Number without. 15	Number with. 3	Number without.
One		Two.....		None		131	
7		11		15		15.....	









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